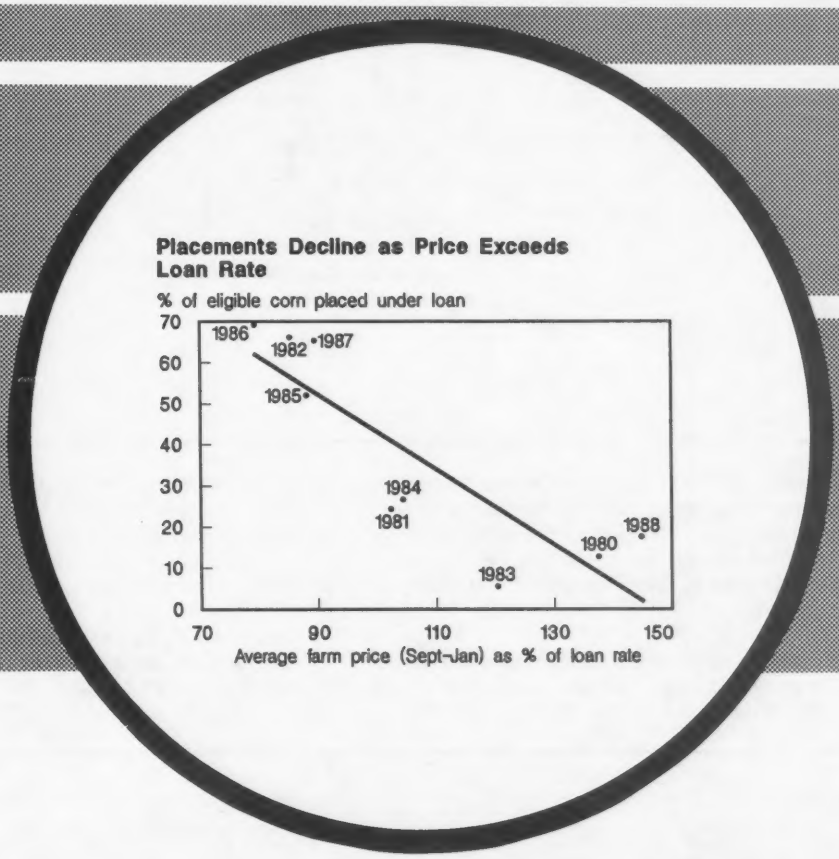
United States
Department of
Agriculture

Economic
Research
Service

FdS-311
August 1989

Feed

Situation and Outlook Report



Feed Situation and Outlook Commodity Economics Division, Economic Research service, U.S. Department of Agriculture, May 1989, FdS-310.

CONTENTS

	Page
Feed Grain Supply and Use	4
Corn	4
Sorghum	6
Barley	7
Oats	7
Hay	8
Feed Demand	9
Food Seed and Industrial Use of Corn	9
Transportation Update	10
World Coarse Grain Outlook	12
Special Articles	
Recent Issues in Grain Quality	16
History of Farm Income for U.S. Corn Producers	22
List of Tables	26

Situation Coordinator
Larry Van Meir (202) 786-1840

Principal Contributors
Larry Van Meir (202) 786-1840
Allen Baker (202) 786-1840
T.Q. Hutchinson (202) 786-1840
Peter Riley (202) 786-1825
Jenny Gonzales (202) 786-1840

Electronic Word Processing
Susan K. White

Approved by the World Agricultural Outlook Board. Summary released August 22, 1989. The summary of the next *Feed Situation and Outlook* will be released November 17, 1989. Summaries of Situation and Outlook reports, including tables, may be accessed electronically. For details, call (202)447-5505.

Feed Situation and Outlook is published three times a year and is supplemented by a yearbook. Subscriptions are available from ERS-NASS, P.O. Box 1608, Rockville, MD 20850. Or call, toll free, 1-800-999-6779 (weekdays, 8:30-5:00 ET). Rates: 1 year $10, 2 years $19, 3 years $27. Foreign customers add 25 percent for subscriptions mailed outside the United States. Make checks payable to ERS-NASS. Single copies are available for $5.50 each.

Time to renew? Your subscription to *Feed Situation and Outlook* expires in the month and year shown on the top line of your address label. If your subscription is about to expire, renew today. Call 1-800-999-6779.

Summary

U.S. feed grain production is forecast to rebound sharply from the drought-reduced 1988 level, pushing the global 1989/90 coarse grain crop almost 10 percent above a year earlier. However, global coarse grain stocks may drop to their lowest level since 1983/84 by the end of 1989/90 because of expanding use and sharply lower carryin stocks.

The U.S. feed grain harvest for 1989 is estimated at 217.6 million metric tons, based on an early August survey by the National Agricultural Statistics Service (NASS). This is 46 percent above last year's 149.2 million tons. Area harvested is forecast to increase 11.2 million acres, or 14 percent, because less area was idled under annual programs and fewer acres abandoned. Improved growing conditions increased the forecast yield per acre to 2.38 metric tons, 28 percent above last year.

The U.S. feed grain supply for 1989/90 is forecast at 282 million tons, almost the same as last year. The likely increase in this year's crop will not completely offset a projected drawdown of 70 million tons in beginning stocks.

Total U.S. use in 1989/90 is projected at 226 million tons, an increase of 5.1 million from the forecast for 1988/89. Domestic use is expected to rise by almost 9 million, but exports may drop because of greater competition from foreign shippers. With use likely to exceed production, U.S. stocks may drop more than a tenth. However, prices are also expected to decline because of lower loan rates and reduced drought psychology in the market.

Global 1989/90 coarse grain production is projected at 800 million tons, up 10 percent from 1988/89. While foreign production may be nearly unchanged, significant increases are expected in the major competing exporters, except for the EC and South Africa. A tightening in the coarse grain supply/use situation appears likely in 1989/90. World consumption is forecast to rebound about 14 million tons, exceeding production for the third consecutive year.

For 1988/89 total U.S. corn use is forecast at 7.4 billion bushels, down 345 million from a year earlier. Exports are expected to be up around 370 million bushels and food, seed, and industrial use near 25 million, but feed and residual disappearance is expected to drop almost 740 million. Use is expected to exceede the 4.9-billion-bushel 1988 crop by about 2.5 billion bushels, dropping forecast 1988/89 ending stocks to around 1.8 billion. The farm price will average about 30 percent higher in 1988/89 than the preceding year.

NASS forecast this year's corn crop at 7.3 billion bushels. Beginning stocks and imports would give a supply for 1989/90 of 9.2 billion bushels, same as for 1988/89. Use may rise to 7.5 billion in 1989/90, implying a further drawdown in stocks of about 150 million bushels.

Sorghum use is forecast at 800 million bushels, 20 million less than a year earlier. Domestic use will be down almost 90 million, but exports up 70 million. Use likely will exceed the 1988 crop by 220 million, which is reflected in a decline in ending stocks to 440 million bushels on September 1, 1989.

Sorghum production for 1989 may be up 15 percent from last year. With sharply lower carryin, supply for 1989/90 would be 1.1 billion bushels, 140 million less than a year earlier. Because use is forecast down only 10 million from 1988/89, stocks would be drawn down to 314 million bushels on September 1, 1990.

This year's barley crop is forecast up 35 percent from 1988. Area for harvest increased 1 million acres and estimated yield 19 percent. Beginning stocks of 197 million bushels and forecast imports of 15 million put supply for 1989/90 at 604 million, 20 million less than last year. Total use for 1988/90 is forecast at 430 million bushels, almost the same as last year.

The oat crop may be up 74 percent from 1988. Use for 1989/90, estimated at 412 million bushels, will be up 110 million. The surge in food use of oats and increased feed and residual disappearance are responsible for the rise.

The hay supply for 1989/90 of 162.8 million tons is up about 6 percent. This year's crop of 145.2 million tons more than offset the low beginning stocks of 17.6 million. Hay prices, although currently above last year, are expected to average lower for 1989/90.

Feed demand is expected to increase in 1989/90 as the number of grain consuming animal units rises about 1 percent. Large increases in placements of broilers and turkeys on feed this summer likely will carry into next year and account for most of the gain.

Food, seed, and industrial use of corn for 1988/89 is expected to total 1.26 billion bushels, up 2 percent from a year earlier. A larger area planted increased seed use. Production of high fructose corn syrup, glucose, and dextrose all will increase in 1989/90, but starch output may only equal a year earlier.

Transportation facilities are expected to be capable of handling grain flows in 1989/90. Tow and draft restrictions have been reimposed on the Mississippi River but apparently are not restricting the volume of grain moved.

Feed Grain Supply and Use

The National Agricultural Statistics Service (NASS) forecast production of feed grains as of early August at 217.6 million metric tons, 68.4 million tons, or 46 percent above last year's drought-stricken harvest. Carryin stocks, forecast at 63.4 million tons, and imports at 1.1 million, bring estimated total supply of feed grains for 1989/90 to 282.1 million tons, slightly below the previous year's 284.2 million.

World production of coarse grains for 1989/90, largely reflecting the improvement in U.S. production prospects, is estimated at 800 million tons, up about 10 percent, or 70 million from the 1988/89 crop. Foreign production is forecast at 582 million tons, up only 1.7 million, or 0.3 percent.

A 71-million-ton drawdown of world stocks is forecast in 1988/89. Thus, total world coarse grain supply for 1989/90 will be slightly below a year earlier. Total world use is projected to rise 1.7 percent in 1989/90 to more than 814 million tons, thus, use will exceed production for a third consecutive year. Ending stocks in 1990 are forecast at 127.8 million tons, 10 percent below the 142.5 million tons forecast for 1988/89. The projected decline of 14.7 million tons will be almost equally divided between the U.S. (7.3 million) and foreign stocks (7.5 million).

Feed Grain Supply and Use for June-May Year

A more consistent estimate of feed grain supply and use for the U.S. comes from a June-May comparison rather than combining a June-May year for barley and oats with a September-August year for corn and sorghum. The total supply of feed grains for June-May 1988/89 was 327.9 million tons, down 20 percent from 1987/88. June 1, 1988, stocks were 7 percent smaller, but production was down 31 percent because of the widespread drought in 1988. Imports of 1.4 million tons, up 27 percent, only comprise 0.4 percent of the total supply.

Feed and residual use for June 1988 through May 1989 totaled 123.4 million tons, down about 13 percent from 1987/88 disappearance of 142.4 million tons. Feed and residual use amounted to 56 percent of total disappearance, compared with 62 percent in 1987/88 and over 64 percent in 1986/87. Partly offsetting the decline in feed and residual use were increases of 3 percent in FSI use and 26 percent in exports. Total use in 1988/89, at 221.2 million tons, was only 4 percent less than year-earlier disappearance, resulting in a drawdown in stocks from 177.3 million tons June 1, 1988, to 106.7 million June 1 this year.

Based on the August Crop Production report, the supply of feed grains for June-May 1989/90 is forecast at 325.4 million tons, about 1 percent less than for June-May 1988/89. The increase in this year's August crop estimate was not quite sufficient to offset the drawdown in stocks during 1988/89.

Feed grain prices are expected to average lower for 1989/90. The drought psychology that held prices up during 1988/89 is likely to be absent or lessened this year. If precipitation is normal over the Corn Belt this fall through next spring, and the temperature is average next spring, prices may be 15 to 25 percent lower than during 1988/89. However, if conditions turn dry next spring, prices likely will not drop as much relative to last year.

Corn

Third Quarter 1988/89 Use Down

The corn supply for the March-May 1988/89 quarter totaled slightly over 5.2 billion bushels. March 1 stocks included 465 million bushels of Commodity Credit Corporation (CCC) holdings, 995 million bushels of Farmer Owned Reserve (FOR) loans, 1.1 billion bushels of regular 9-month CCC loans, and 2.7 billion bushels of unencumbered (free) stocks. The free stocks were more than sufficient to meet market needs for the quarter. However, the price received by farmers averaged $2.58 a bushel during the quarter and most of the corn under regular loans could have been redeemed for cash and profitably sold at that price.

Table 1--Feed grains: Supply, disappearance, and ending stocks, June/May, 1980/81-1989/90

Year	Supply				Disappearence				Ending stocks	
	Beginning stocks	Production	Imports	Total	Food & indus.	Feed & resid.	Export	Total	Government	Total
	Million metric tons									
1980/81	107.2	197.9	0.3	305.4	23.0	128.1	73.6	224.7	7.6	80.7
1981/82	80.7	246.2	0.4	327.3	25.2	127.1	61.4	213.7	7.9	113.6
1982/83	113.6	250.2	0.4	364.2	27.2	136.8	53.8	217.8	14.0	146.4
1983/84	146.4	136.4	0.7	283.5	29.7	126.3	56.9	212.9	24.6	70.6
1984/85	70.6	236.9	0.8	308.3	31.7	128.9	58.4	219.0	10.3	89.3
1985/86	89.3	274.4	0.7	364.4	34.8	136.3	40.7	211.8	25.5	152.5
1986/87	152.5	252.3	0.9	405.6	35.4	138.2	40.7	214.4	49.8	191.3
1987/88	191.3	215.4	1.1	407.7	36.5	142.4	51.4	230.4	47.3	177.4
1988/89	177.4	149.2	1.4	327.9	37.6	123.4	60.1	221.2	20.5	106.7
1989/90	106.7	217.6	1.1	325.4	NA	NA	NA	NA	NA	NA

NA = Not available.

Table 2--Corn supply and use, March-May

Item	1987/88	1988/89
	Million bushels	
Supply:		
Stocks March 1	7,635.6	5,203.9
CCC	1,767.7	465.0
FOR	1,481.3	995.3
Loan	2,963.7	1,062.5
Free	1,422.9	2,681.1
Imports	1.6	1.9
Total supply	7,637.2	5,205.8
Disappearance:		
FSI	331.7	339.0
Exports	513.8	600.2
Feed and Residual	956.2	847.6
Total	1,801.7	1,786.8
Stocks June 1:		
CCC	1,304.9	417.7
FOR	1,447.5	945.6
Loan	2,062.6	811.7
Free	1,020.5	1,244.0
Total	5,835.5	3,419.0

Disappearance for the March-May quarter was nearly 1.8 billion bushels, 1 percent less than year-earlier use. Food, seed, and industrial use (FSI), at 329 million bushels, was 2 percent above last March-May use, and exports of 600 million bushels were up almost 17 percent. In contrast, feed and residual disappearance of 848 million bushels was down 11 percent from the 956 million of a year earlier. This quarter's decline reinforces the reduction in feed and residual disappearance associated with a drought year. For September-May 1988/89, disappearance was 3.26 billion bushels — 638 million less than a year earlier. For the drought-affected crop years of 1974/75, 1980/81, and 1983/84, the decreases from a year earlier in feed and residual disappearance for September-May were 724 million, 293 million, and 447 million bushels, respectively.

March-May use left a little over 3.4 billion bushels of corn in stock June 1, which included CCC holdings of 418 million, FOR loans of 946 million, regular loans of 812 million, and free stocks of 1.2 billion bushels. About 750 million bushels of the regular loans were redeemable at prevailing prices during June and July. Thus, about 2.0 billion bushels of the June 1 stocks were available to the market during June and July. Imports during the June-August quarter are expected to add nearly a million bushels to supply for the quarter.

There was a major change in the market source of corn in the March-May quarter this year from 1988. Last year, total use was slightly over 1.8 billion bushels, with generic certificate exchanges accounting for a little over 1.1 billion and cash sales the balance of 662 million bushels. An estimated third of the cash sales were from CCC inventories and the balance was from free stocks. This year, disappearance was slightly under 1.8 billion bushels, with only about 80 million bushels from generic certificate exchanges and 1.7 billion from cash sales. About 1.4 billion of cash sales were from free stocks and the balance from cash redemptions of 18 million from the FOR, 245 million from regular loans (including extended loans), and CCC cash sales of less than 5 million bushels.

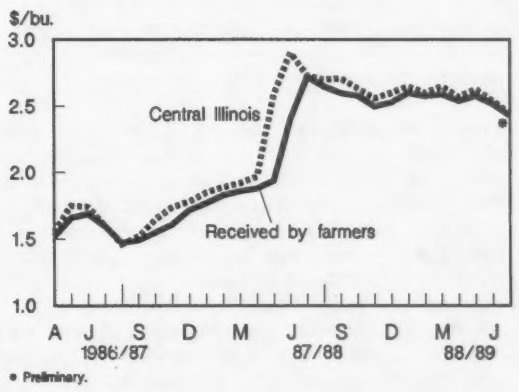
Disappearance for the June-August quarter is forecast at nearly 1.6 billion bushels, comprised of 338 million bushels FSI, 510 million in exports, and feed and residual use of 742 million bushels. With supply forecast at slightly over 3.4 billion bushels for the quarter, this disappearance would leave a little more than 1.8 billion bushels on hand September 1 as beginning stocks for the 1989/90 crop year.

Based on U.S. Export Sales reports, exports for June and July were well on track for the forecast of 510 million for the quarter. Because of data lags, little information is available on FSI use for the June-August quarter. For feed and residual disappearance, livestock numbers imply a reduction of total concentrates needed for the summer quarter from a year ago. Slightly fewer cows are being milked this summer but this is more than offset by an increase in concentrates fed per cow. Market hogs on farms June 1 were down 1 percent, and the number of cattle on feed July 1 in the 13 major feeding States was down 6 percent. Broilers raised this summer are up 8 percent, and turkeys placed on feed are up about 7 percent, but the laying flock is about the same as last summer. However, broilers and turkeys consume less concentrates per head per day and the mix contains a higher proportion of protein than that for cattle and hogs on feed. Thus, the increases in turkey, broiler, and dairy feeding this summer are not expected to completely offset the decline in energy feeds used in cattle and hog feeding.

Weather Uncertainty Supports Prices During Spring and Early Summer

Weather-generated fear of another poor corn crop this year was a dominating factor in the market this spring and early summer. Extremely short subsoil moisture in the western

Figure 1
Monthly Average Corn Prices



* Preliminary.

Corn Belt and excessive rain in Indiana, Ohio, and the Southeast threatened plantings and/or yields to the extent of more than offsetting the larger potential plantings resulting from less acreage idled by Government programs this year.

In mid-May, North Carolina was 53 percent planted, compared with an average of 90 percent for the previous 5 years. By the end of May, Indiana, Ohio, and Pennsylvania were 40 percent, 13 percent, and 17 percent planted, compared with the previous 5-year averages of 70, 75, and 43 percent, respectively. It was feared that such delayed planting could sharply reduce yields and increase risk of loss from an early freeze.

Even though stocks were adequate to meet market needs, threat of reduced yields for the 1989 corn crop kept the effective market supply tight. The resulting rise in prices induced some farmers to sell to meet exports and processing needs in the spring and early summer. No. 2 yellow corn averaged $2.54 at central Illinois elevators the first half of April, $2.63 for May, $2.54 in June, and hit the summer high to date on July 5 at $2.74. July turned out to be an excellent growing month for corn. Temperatures were below average and precipitation was about an inch above average, both conditions improved yield prospects. Precipitation and cooler temperatures eased corn prices and the central Illinois average for July was $2.45, and $2.25 for the first 9 days of August. However, dry weather over the western Corn Belt the first half of August turned prices back up somewhat.

Corn Crop Estimated at 7.3 Billion Bushels

NASS added questions to the August survey for Indiana, Ohio, and Pennsylvania to determine the amount planted. Earlier, farmers had indicated intentions to plant but had not been able to at the time of the June acreage survey. The area planted in Indiana was reduced 150,000 acres, in Ohio by 300,000 acres, and in Pennsylvania 20,000 acres. Thus, the area planted for the U.S. is now 72.3 million acres, compared with 72.8 million reported in July. The area to be harvested for grain was reduced by 540,000 acres for Indiana, Ohio, and Pennsylvania, by 100,000 acres in Texas, and 50,000 in North Dakota. U.S. area to be harvested for grain is 65.2 million acres, down almost 700,000 from the 65.8 million reported in July.

Based on crop conditions around August 1, the U.S. average yield was forecast at 112.8 bushels per acre and total production at 7.348 billion bushels. Even though July was an excellent growing month, the corn crop is far from being made, particularly in view of the late plantings in some areas. By mid-August, pollination was about complete so temperature is less of a threat to the crop. However, subsoil moisture is still short in the western Corn Belt and timely rains in August and September are needed to improve the yield and crop size. Conversely, a shortage of precipitation could limit ear development and reduce yields. Objective yield measurements will be included in the NASS September Crop Production report to provide more information on the potential size of this year's crop.

Increased Use in 1989/90 Expected to Pull Down Stocks

Based on the August forecast of the 1989 crop, the supply of corn for 1989/90 will be about the same as for 1988/89. Expected carryin stocks of 1.83 billion bushels plus production of 7.35 billion gives a total supply of 9.18 billion.

Total disappearance for 1989/90 is forecast at 7.5 billion bushels, 2 percent above the 7.35 billion expected for 1988/89. Increased demand across the board for processed products is expected to push FSI use to 1.3 billion bushels, up almost 4 percent. Lower feed costs and improved returns to livestock and poultry producers could raise feed and residual use 5 percent to 4.2 billion bushels. Exports are projected to total 2 billion bushels in 1989/90, 100 million less than expected to be exported this year.

With supply for 1989/90 about the same as this year, and use up, ending stocks may drop 150 million bushels. This would put ending stocks September 1, 1990, at 1.68 billion bushels, 22.4 percent of use. If subsoil moisture is replenished in the western Corn Belt this fall and winter, and weather is normal next spring and early summer, the drought psychology would abate and prices likely would average 15 to 25 percent below 1988/89. However, if subsoil moisture continues short, and less than normal weather prevails next spring and early summer in the Corn Belt, the drought factor would intensify and prices would not drop as much.

Sorghum

Exports Drive Use Up

Use for the September 1988-May 1989 period totaled almost 682 million bushels, 1 percent above the comparable period in 1987/88. Exports at 238 million bushels were up 28 percent, while FSI use was 19 percent higher. However, feed and residual disappearance of 426 million bushels was down 10 percent.

Stocks on hand June 1 amounted to almost 559 million bushels, of which 409 million were tied up in CCC inventory and FOR loans. An additional 40 million bushels are under regular loans (including extended loans from previous crop years) but over half of these are from the 1988 crop and available to the market at current prices. Total use for June-August is forecast at 119 million bushels, which would leave ending stocks of 440 million bushels. Free stocks on hand June 1 were sufficient to meet market needs for the last quarter. In addition, about 40 percent of this year's crop in Texas had been harvested by August 1.

1989 Crop Estimated at 664 Million Bushels

Based on conditions around August 1, NASS forecast this year's sorghum crop at 664.1 million bushels harvested from 10.5 million acres. The August yield forecast was 63.1 bushels per acre, 0.7 of a bushel below last year's yield. Sorghum producers harvested a 1988 crop of 557.6 million bushels from 9.1 million acres.

If September 1 stocks equal the current forecast of 440 million bushels, total supply for 1989/90 would be 1.1 billion bushels, down 11 percent from 1988/89's 1.24 billion bushels. Use during 1989/90 is projected to be down slightly to 790 million bushels. Feed and residual disappearance may be 5 percent above the 475 million bushels forecast for 1988/89. Distillery purchases of sorghum ran high for the first 7 months of the 1988 crop year but then dropped to a more normal level. Distillery use is expected to follow a normal pattern in 1989/90 which will likely reduce FSI use about 10 million bushels. Exports, estimated to reach 300 million bushels in 1988/89, likely will be down about 25 million in 1989/90 because of greater competition and reduced world imports. With 1989/90 supply forecast down about 130 million bushels, and use expected to drop only marginally, stocks on hand September 1, 1990 may be down almost 30 percent from the expected ending level for 1988/89. This compares with the average for ending stocks over the 1976-1985 period of almost 228 million bushels. Ending stocks were inordinately high for 1985/86-1987/88.

The price received by farmers for sorghum averaged $2.29 a bushel for the September 1988-May 1989 period — well above the loan rate of $1.68. Only 40.5 million bushels of the 1988 crop (8.5 percent of sorghum eligible for loan placement) were placed under regular 9-month loans. Placements may be small again in 1989/90. The average farm price for sorghum for 1989/90 is expected to fall in the range of $1.65-$2.05 a bushel so most of the new crop sorghum placed under loan likely will be marketed during the year.

Barley

Total barley use in 1988/89 was 427 million bushels, 131 million less than the preceding year. FSI use was up slightly, but exports were off 41 million bushels and feed and residual disappearance was down 96 million. This was the lowest feed and residual disappearance since the 1953/54 marketing year. Even with the sharp cut in use this past year, ending stocks were drawn down 124 million bushels to only 197 million on hand June 1, 1989. This was the tightest ending stock since 1983/84. Stocks at the end of 1983/84 were 189 million bushels and were equivalent to 35 percent of use during the 1983/84 crop year. The 1988/89 ending stocks were equal to 46.1 percent of use.

The weighted average farm price for barley in 1988/89 was $2.79 a bushel, equal to 1980/81, but below the record $2.81 in 1974/75. The spread between malting barley prices and feed barley prices at Minneapolis (feed barley prices quoted at Duluth beginning March 1987) was $1.79 a bushel for the 1988/89 crop year. Since 1962, when ERS started recording malting barley prices, the previous widest spread was $1.58 in 1974/75.

July weather in Minnesota, North Dakota, Montana, and Idaho hurt this year's crop, particularly in the first two, where hot, dry conditions decreased the August yield forecast 12 bushels from July. The barley crop in August was forecast at 392.1 million bushels, down 53 million from July, but still more than 100 million above the 1988 crop of 290.5 million. The U.S. average forecast yield dropped from 51.3 bushels an acre in July to 45.8 in August, and area indicated for harvest declined 100,000 acres (North Dakota). However, both area and yield remain well above 1988.

While the 1989 crop is forecast 100 million bushels larger than last year's harvest, the 1989/90 supply may be down about 20 million bushels because of reduced beginning stocks. Stocks this June, at 197 million bushels, were 124 million less than June 1, 1988.

This year's malting barley production is expected to be up from last year, although quality will still be a problem for parts of North Dakota and Minnesota because the hot, dry weather in July reduced kernel size and raised the protein level. The price of high-quality malting barley rose 30 cents a bushel at Minneapolis between mid-July and mid-August. In contrast, prices fell about 35 cents a bushel during the same period last year. However, the malting barley price this year is 80 cents a bushel below mid- August 1988. The farm price for 1989/90 likely will average about 35 to 75 cents a bushel below the 1988/89 price of $2.79 a bushel.

Use in 1989/90 is forecast at 430 million bushels, about the same as in 1988/89. Feed and residual disappearance is forecast to increase 25 to 30 million bushels, while little change in FSI is expected. Exports, however, may drop about 25 million bushels. Given the lower supply, use about equal to last year would leave ending stocks down about 25 million to 174 million bushels on June 1, 1990, or equivalent to 40.5 percent of projected use.

Oats

Oat production in 1988 was 219 million bushels, down sharply from 374 million in 1987 because of the drought. Beginning stocks in 1988/89 were 112 million bushels and imports were 68.4 million for a total supply of 399 million, 28 percent below the year earlier. Supply would have been even lower if imports had not increased 48 percent from 1987/88 to the highest level since the 80 million bushels imported in 1953/54.

Domestic use, at 300 million bushels, was down 32 percent from 1987/88. Processing use was up sharply because of the growth in consumption of oat products, especially bran. Seed use in 1988/89 was down 13 percent because of the drop in planted acres in 1989. Feed and residual use was down 45 percent from 1987/88 in response to low supplies and high prices. Even with the lower use, stocks dropped almost 12 percent to 98 million bushels. The ending stocks-to-use ratio was 32.6 percent, up from 25.4 in 1987/88, but still below the previous 10-year average of 37 percent.

The weighted average price received by farmers for 1988/89 was $2.61 per bushel, $1.05 higher than the previous year. The simple average price for No. 2 heavy white oats at Minneapolis was $2.91 for June 1988 - May 1989, an increase of 99 cents over 1987/88. Prices received for oats relative to corn were well above what would be supported by relative feeding values (0.5) during the 1988/89 feeding year. With the exception of horses, feeders would generally use corn rather than oats in their feed rations which explains the large drop in feed and residual use of oats. The preliminary estimate for the price received by farmers in July gives an oats-to-corn ratio of .7, down from 1.1 a year ago and moving closer to the relative feeding value of .5. In mid-August, the price of No. 2 milling oats at Milwaukee was $1.61 a bushel, compared with $3.06 a year earlier.

Preliminary program enrollment for producers in 1989 is 23 percent, a decrease from 30 percent in 1988. Acreage reduction program (ARP) requirements remain 5 percent. Estimates for 1989 indicate 100,000 acres were taken out of production to satisfy ARP requirements and 200,000 were idled under the 0-92 program.

Oat Production Up Sharply in 1989

Oat production for 1989 is forecast at 381 million bushels, up 74 percent from 1988. Year-to-year gains in harvested area of 30 percent and yield of 34 percent are forecast. The number of acres planted was down 13 percent from last year but this includes oats used as a cover crop on land idled under various Government programs. Beginning stocks are 98 million bushels and imports are expected to total 50 million. Thus, supply in 1989/90 is forecast at 529 million bushels, up a third from 1988/89, but still 4 percent below 1987/88.

Domestic use in 1989/90 is projected to be 410 million bushels, about 110 million over 1988/89. Most of the increase is expected to be in feed and residual use, although continued gains in food, seed, and industrial (mostly food) are expected. The rapid growth of products made with oat bran is expected to continue to boost food use of oats in 1989/90. If supplies and use turn out as projected, ending stocks could edge up to 124 million bushels. This would result in a stocks-to-use ratio of 30 percent, down slightly from 1988/89's 33 percent.

Prices received for oats by farmers usually reflect not only supplies of oats but competing feed grains. Thus prices will be seasonally low at oat harvest and then hit another low at corn harvest. In the last few years, short supplies of oats plus specialized feeding demands (and sharply rising food demand) for oats have altered the usual patterns. In 1988/89, the drought and spriraling food demand fueled price. With a larger crop expected, specialized feed and food uses will take less of the crop. Thus, prices will likely drop sharply and for 1989/90 may average $1.55 to $1.95 per bushel. In 1988/89, the weighted average farm price was $2.61 a bushel.

Hay

Hay Yield Still Below Average

Hay production in 1989/90 is estimated to total 145 million tons, up sharply from the drought-reduced level in 1988/89 of 127 million. The 63 million acres expected to be harvested in 1989/90 compare with nearly 66 million in 1988/89 which included substantial acreage of set aside and conservation reserve acres allowed to be harvested for hay due to the 1988 drought.

Yields in 1989/90 are forecast at 2.31 tons per acre, up from 1.93 tons in 1988/89, but still low relative to the average for 1983/84 through 1987/88 of 2.44. Yields are probably below average because of the dryness in the Great Plains. Yields in Kansas, Iowa, Nebraska, North Dakota, and Texas, while improved from last year, are still low relative to 1986 and 1987. The wet spring in the eastern Corn Belt and the storms in the Southeast do not seem to have hurt hay yields but may have lowered quality if farmers were not able to harvest at the desired time.

Supply Improved from Last Year

Carryover stocks on May 1, 1989, totaled 17.6 million tons, down 36 percent from 1988. The increase in production from last year will likely result in a supply of nearly 163 million tons, up about 9 million tons from 1988/89. If roughage consuming animal units (RCAU's) are about the same as in 1988/89, hay supplies per RCAU will be 2.08 tons, well above the disappearance per RCAU in the past few years.

Hay prices received by farmers have been declining since April. Alfalfa hay in April was $110 per ton, but by July had dropped to $91.40. Production of alfalfa hay in 1989 is forecast 12 percent above 1988 but still 8 percent below 1987. Since alfalfa hay is primarily fed to dairy animals, but also used in cattle feeding, supplies in the major dairy States have a strong impact on prices. Demand from manufacturers who make alfalfa pellets is also a major factor. For Kansas and Nebraska combined, both important pelleting States and cattle feeding States, alfalfa production in 1989 is forecast to be 9 percent above 1988 but still 9 percent below 1987. Alfalfa hay production in 1989 in the top 10 milk producing States

is forecast up 15 percent from 1988 but down 3 percent from 1987. Alfalfa hay prices may move to the mid $80's per ton in coming months.

Feed Demand

The indexes of grain and roughage consuming animal units (GCAU's and RCAU's) in 1988/89 are nearly the same as in 1987/88. In 1989/90, GCAU's will likely be up about a half million units from last year if expected poultry production is realized. RCAU's will likely remain about the same because little increase is expected in beef and dairy cattle numbers. Unlike 1988/89 when feed and residual use of the four feed grains (corn, sorghum, barley and oats) dropped in spite of little change in animal numbers, feed and residual use will likely rise in 1989/90. In 1988/89, feed and residual use of feed grains and wheat is estimated at 124 million metric tons, down from 153 million in 1987/88. Feed and residual use in 1989/90 may increase 8 million metric tons from 1988/89 but will still be below 1987/88.

The number of dairy cows on farms April through June 1989 was 1.3 percent below last year's 10.2 million head. However, milk per cow was up 1.8 percent from last year, strengthening feed demand. On July 1, the pounds of grain and other concentrate fed per cow was also 1.8 percent above the 16.8 pounds reported for 1988. If the feeding rate for June-August was the same as on July 1, less than 1 percent more grain and other concentrates would have been fed for the quarter in 1989 than in 1988.

Part of the increase in grain and other concentrates fed on July 1 may have been in response to late-developing alfalfa because of cool weather and limited supplies of higher quality hay. Even with more concentrates, the year-to-year increase in milk per cow in June was less than earlier months. Lower feed costs in the remainder of 1989 and into 1990 are expected to encourage increased concentrate feeding. In addition, high-quality hay may be limited if the rains in the Eastern Corn Belt and Southeast cause harvest problems and drought reduces supplies in the western Corn Belt and Northern Plains. If supplies of high-quality hay are limited and prices strong, more concentrates may be fed to balance rations, helping to boost feed demand.

Cattle going on feed in 1989 have been heavier than a year earlier, have spent less time in the feedlot, and have averaged heavier marketing weights. Numbers of cattle on feed in 1989 and 1990 are expected to be about the same as in 1988. Lower feed prices may encourage placing lighter weight cattle in 1990 and thus provide some boost in feed use.

Feed demand in 1988/89 by the poultry sector is expected to be strong for meat production but about level for eggs.

Table egg production has been below year-earlier levels since the second quarter 1988 when feed costs began increasing. The expected decline in feed costs and higher egg prices may result in a small year-over-year increase in table egg production in the fourth-quarter of 1989. In April 1989, producers began increasing the number of pullets to be added to the flocks. These pullets will slow the decline in the average number of hens and begin to increase layer numbers. Egg production is forecast up slightly in 1989/90.

Strong prices for broilers has led to sharply increased 1988/89 production and resulted in the industry adding pullets to the hatchery supply flock. As a result, feed demand by the broiler sector is expected to be up in 1988/89 and 1989/90. In 1987/88, federally inspected broiler production was up almost 6 percent from a year ealier. The high grain prices and the possibility that red meat producers would liquidate herds caused broiler producers to slow expansion to 3 percent above a year earlier in the October 1988-March 1989 period. However, strong broiler prices have encouraged increased numbers and production may be up 7 to 8 percent in April-September 1989. Declining feed prices and continued relatively strong broiler prices may push broiler output up 7 percent or more in 1989/90.

Turkey production in October 1988-March 1989 was down 4 percent from a year earlier reflecting low returns during the first half of 1988. However, declining feed prices and stronger demand have increased output. Turkey poults placed on feed during September 1988 through June 1989 were 6 percent above the previous year. If July and August placements remain well above last year, the 1988/89 total could be 7 percent. If returns remain positive for producers through the fourth quarter, turkey production in 1990 will continue to expand and help increase the demand for feed.

Food, Seed, and Industrial Use of Corn

FSI use of corn September 1988 through August 1989 is expected to total 1,255 million bushels, up 2 percent from last year. Nearly all of the increase is in corn sweetener production, with starch and alcohol expected to be nearly the same as last year.

Midwest prices for 42-percent HFCS declined during the fall and winter of 1988 but have recovered to the year-earlier price of 21.60 cents per pound this summer. However, most users had earlier contracted for their needs through September. Spot HFCS prices were likely pushed up in June and July by an increase in raw cane sugar prices. Another reason for an increase in spot prices for HFCS is that most producers are at capacity and supplies are limited for spot market sales. However, cooler-than-normal temperatures in some major population centers this summer may have softened the

Table 3--Corn: Food, seed, and industrial use 1/

Year beginning September 1	Wet-milled products: HFCS	Wet-milled products: Glucose and dextrose	Wet-milled products: Starch	Wet-milled products: Alcohol	Dry-milled alcohol	Dry-milled and alkaline cooked products	Seed	Total
	Million bushels							
1975	45	162	116	5	20	154	20	522
1976	62	164	116	10	15	155	20	542
1977	80	170	124	10	20	158	20	582
1978	105	170	124	15	20	155	20	609
1979	127	170	120	25	20	158	20	640
1980	165	183	120	35	35	160	20	718
1981	185	183	130	83	35	162	19	797
1982	215	188	127	130	50	170	15	895
1983	256	189	147	150	50	164	19	975
1984	310	187	143	170	100	160	21	1,091
1985	328	188	152	185	127	161	19	1,160
1986	339	185	155	200	135	161	16	1,191
1987	359	187	167	200	136	163	17	1,229
1988	375	196	166	200	134	165	19	1,255

1/ Data are estimates based on production and sales figures from Government and private industry.

increase in demand for soft drinks and HFCS. Sales of HFCS are seasonally high during the summer since it has replaced sugar in most soft drinks.

Production of glucose and dextrose in September 1988 - August 1989 is expected to be up from last year despite higher prices for corn during much of this period. These products have cost more since corn prices increased, but demand has not weakened to the point of forcing down sweetener prices.

The amount of corn used to produce starch between September 1988 and May 1989 was about equal to last year's total. Prices of corn starch in early 1989 were near 10 cents per pound, compared to 11 cents in 1988. With higher corn prices, starch producers would be expected to boost prices however demand is insufficient to support an increase.

Corn used in alcohol production in 1988/89 is expected to total about the same as in 1987/88. While sales of gasoline blended with ethanol have been slightly below last year, the percentage of fuel alcohol using corn as a feedstock may be higher. Fuel alcohol use is expected to remain stable during the remainder of the corn marketing year. A few more cities have enacted laws specifying oxygenated fuel use during the winter, which may help alcohol blend sales. But ethanol presents technical problems which generally prohibit its transportation in fuel pipelines. As a result, the oxygenated fuel market may be captured largely by natural gas-based methanol derivatives rather than ethanol. Corn used by the beverage alcohol industry was up slightly in September 1988-March 1989 (the latest data available). Most of this increase happened in March.

Transportation Update

Transportation Situation and Outlook Favorable

Barges

Volume Increases. The volume of grain and soybeans shipped on the Mississippi River in September 1988-July 1989 averaged 3.3 million tons per month, 0.3 percent above the corresponding period in the two preceeding crop years.

Restricted Conditions Return. Restrictions on the number of barges allowed in a tow and drafts of barges similar to those imposed by the U.S. Coast Guard last fall, have been in effect since mid-July. It appears, however, that these restrictions have not reduced volume. Indeed it is likely that by reducing groundings of tow boats, grain shipments have improved.

As measured at the St. Louis, Missouri flood gauge, substantially greater channel depths were available in June and July

Figure 2
Average Monthly Grain Shipments: Mississippi River and Illinois Waterway

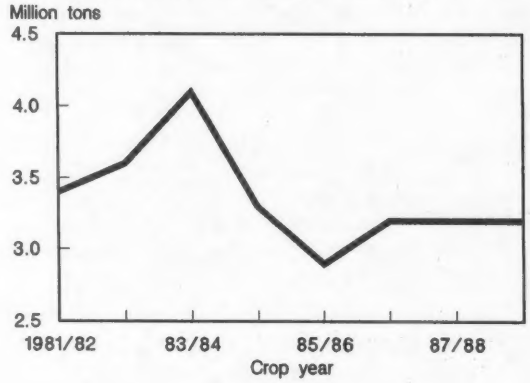
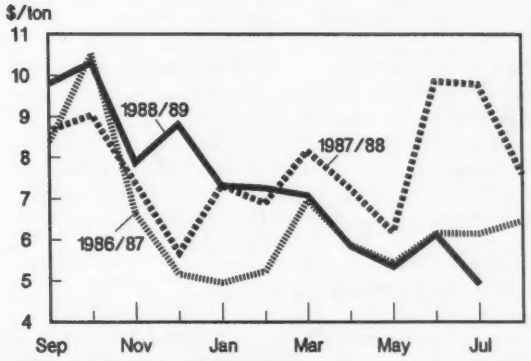


Figure 3
Mississippi River Barge Rates



Peoria to New Orleans via Illinois Waterway.

1989 than in those months of 1988. These gauges do not indicate the channels depth but are a measure of the river level to a selected point on the gauge. Channels may remain navigable despite low flood gauge readings. Partly as the result of improved navigation conditions, June 1989 volume was 14 percent above the same month of 1988. The river at St. Louis averaged nearly 7 feet above 0 on the gauge in June. In July, the reading was 2 feet above 0.

Rains provided more than adequate water for barge operations at Baton Rouge and New Orleans. Barges have been rapidly unloaded and returned to service. As a result, barges have remained in good supply and readily available to meet harvest needs.

The U.S. Army Corps of Engineers has revised its plans to close the Mississippi River above Alton, Illinois, to replace an old lock and dam complex. The Corps now plans to close the river for 6 days in early December, but will delay that action if a large number of barges remain upstream. Barge shipments of grain normally peak in November then fall sharply during December-February when ice closes the upper Mississippi. The planned interruption to navigation is unlikely to impact either the volume of exports or domestic feed grain prices.

Early in the 1988/89 crop year barge rates had been well above a year earlier, chiefly because of impaired navigation conditions. As barge operators, the Coast Guard, and Army Corps of Engineers learned to cope with low water, rates fell sharply between December and May. Rates from Peoria to New Orleans dropped from $8.81 per ton in December 1988 to $5.34 in May 1989. In June, rates rose to $6.13 per ton, but were $3.73 below June 1988. Rates fell again in July, averaging only $4.92 per ton, or $4.87 below July 1988. Preliminary data for August show no indication of a return to 1987-88 levels.

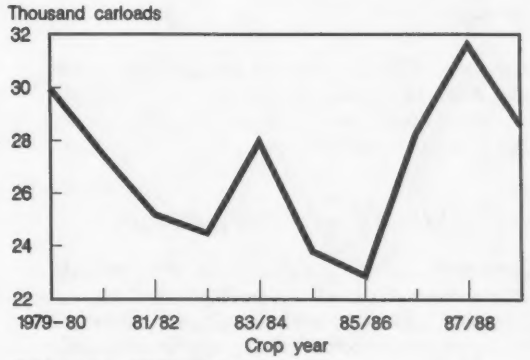
Rail

Volume Down from Record. In the September 1988 - July 1989 period, shipments of grain by rail averaged 28,600 cars per week, 11 percent below the average of 32,000 cars per week a year earlier. Much of this decline resulted from fewer rail shipments to ports. In the prior (September - July) period, deliveries to ports, (not including Great Lakes ports) averaged 10,800 cars per week, nearly one-third of all grain shiped by rail. Through July of this year, grain railed to ports averaged 8,100 cars per week or 28 percent of all grain shipments. Shipments to South Atlantic and Gulf ports declined, on average, from 6,300 cars per week in 1987-88 to 4,400 in 1988-89. Shipments to both North Atlantic and Pacific Coast ports have been 10-11 percent above 1987/88.

This year, grain car loadings peaked in March, averaging 31,700 per week. By July, only 25,000 cars, on average, were loaded each week. Deliveries to ports also peaked in March when nearly 13,000 cars were delivered each week, and fell to an estimated 6,200 cars in July.

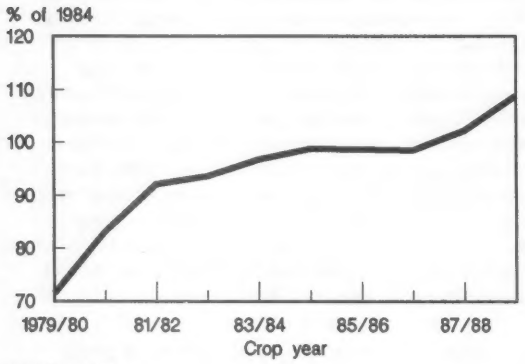
Car Supply Remains Good. Jumbo covered hopper cars have been surplus to shippers' needs in recent months and should remain in adequate supply throughout the harvest season. Several factors contribute to this situation. The supply increased between September 1, 1988, and August 1, 1989, from 237,000 cars to 242,000. This increase stems chiefly from speeding up car repair and returning them to service, rather than from newly purchased cars. October and November are normally the peak months for grain shipments by rail because of marketings of a new crop and repositioning the old one. Ending stocks of grains and soybeans for 1988-89 are now estimated to be 87.5 million metric tons, down 50 percent from 1987-88. This large reduction, combined with a slight increase in off-farm grain storage capacity to 9.6 bil-

Figure 4
Rail Car Loadings of Grain and Soybeans



Weekly averages. 1988/89 preliminary.

Figure 5
Rail Rates for Grain Again Rising Sharply



1988/89 preliminary.

lion bushels suggests that little repositioning will be required to meet storage needs early in the 1989-90 crop year.

Rates Continue Up. The Bureau of Labor Statistics' rail rate index for grain this year has averaged nearly 6 percent above 1987-88. There is some evidence that contract rates have also risen by a like amount. The Burlington Northern Railroad (BN) offers an open market for both unit trains and single car service. Successful bidders receive Certificates of Transportation (COT) which entitle them to the described service at a set rate in the set future month. For example, in early September 1988, the BN's minimum price for a 54-car unit to carry corn eastward, with the unit to be made available or tendered in October 1988, was $89,859. For a February 1989 tender, the minimum price was $87,750. In early August 1989, the same service for October 1989 and January 1990 was $96,552 and $94,446. These represent increases in rates of 7 percent and almost 8 percent, respectively.

In recent months CSX, another railroad, has participated in the COT program. Both BN and CSX are major haulers of grain and changes in minimum bids are indicative of current contract rate levels.

In crop year 1989-90, rail rates for grain are expected to be nudged upward by increasing operating costs, and by a need to replace the oldest jumbo hopper cars which are nearing the end of their service life.

World Coarse Grain Outlook

Global production of coarse grains in 1989/90 is projected at 800 million tons, up almost 10 percent from 1988/89. However, foreign production may be up only marginally to 582 million tons. World consumption is expected to rebound about 14 million tons from an 11-million-ton decline in 1988/89. While the United States will account for much of the gain, foreign coarse grain consumption is also projected to increase 5 million tons. World trade for 1989/90 is projected at 96.7 million tons, about equal to 1988/89.[1]

The current assessment points to a slight tightening in the total supply situation for coarse grains despite the likely rise in production. Further declines in world ending stocks are projected in 1989/90 as use exceeds production for the third consecutive year. Both U.S. and foreign stocks are expected to fall. The ratio of ending stocks to use is projected to drop from 17.8 percent in 1988/89 to 15.7, the lowest since 1983/84.

EC Production Projected to Fall

The largest production decline from 1988/89 will likely take place in the EC where coarse grain output is forecast down 8.6 million tons. This 10-percent decline stems from both reduced area and lower yields. EC barley production is forecast down more than 5 million tons and corn more than 3 million. Most of the drop in corn will occur in France, the major EC producer and exporter. Unusually hot, dry weather in northern Europe has reduced yield forecasts substantially for spring barley and corn. Heat stress has reportedly raised the protein levels and lowered the plump for much of the spring barley crop, probably reducing the availability of top-quality barley for malting.

Conversely, some of the winter planted crops in the EC have benefitted from dry harvest conditions. The volume of EC wheat will increase from 1988/89 and the quality should generally be above average. Quality is up, even in the UK which normally produces much feed quality wheat. If more EC wheat is shifted from domestic feeding into export channels, where market prospects for 1989/90 are favorable, less wheat may be available for feeding. This could raise coarse grain feeding, further lowering the availability of coarse grains for export.

Production of coarse grains in the Soviet Union is projected to be up about 3 percent from 1988/89 to 100 million tons. However, hot, dry conditions in the spring grain area and lower area estimates have cut the crop forecast below earlier expectations. Total grain production is projected at 200 million tons, compared with the 1988/89 crop of 195 million. The total grain area, based on preliminary Soviet reports, will be the smallest since at least 1955.

Bad weather has led to serious crop problems in Turkey and some neighboring countries in 1989/90. Turkey's coarse grain output is forecast to fall 9 percent because of drought damage, with barley down about 14 percent. After bumper

[1] All trade years referred to in this section are October-September and exclude intra-EC trade unless otherwise specified.

harvests in 1988/89, both Iraq and Syria have also experienced adverse conditions, with coarse grain production forecast to drop 40 and 67 percent, respectively.

China's outlook is generally favorable, with coarse grain output projected to rise nearly 2 percent in 1989/90. However, reports that the Government may continue to issue I.O.U.'s in lieu of cash payments to farmers could reduce incentives to sell grain to the Government.

Competitor Prospects Generally Favorable

Except for the EC and South Africa, production increases are expected in all of the major competing exporters in 1989/90. Canada's coarse grain crop is forecast to rebound almost 20 percent from 1988/89's drought-reduced outturn. However, unfavorable conditions in early August in parts of Manitoba and Saskatchewan that have reduced wheat prospects may have also cut some barley yields. Oats are mostly grown in Alberta and have escaped the heat stress. Continuing dryness in Ontario, the major producing area, could damage the corn crop, after a very wet start delayed planting.

Table 4--World coarse grain trade: Major exporters and importers by commodity, 1985/86-1989/90 1/

Item	1985/86	1986/87	1987/88	1988/89 (Forecast)	1989/90 (Projected
	Million metric tons				
CORN					
Exporters:					
U.S.	31.5	39.4	44.5	53.4	51.0
Argentina	7.4	4.0	3.7	2.2	4.0
China	6.4	3.8	4.1	4.0	4.0
Thailand	3.8	2.6	0.8	1.7	1.7
South Africa	1.5	2.6	0.8	2.0	4.0
Others	3.9	4.1	3.0	3.4	2.7
Total	54.5	56.4	56.8	66.5	67.4
Importers:					
Japan	16.6	16.1	16.7	16.0	16.4
USSR	10.3	7.6	8.1	18.7	17.2
EC-12	4.8	2.8	3.3	3.0	3.0
Korea, Rep.	3.6	4.6	5.1	6.2	6.7
Taiwan	3.1	3.5	4.0	4.1	4.2
Mexico	1.7	3.4	3.2	3.0	3.3
China	0.4	1.6	0.3	0.0	0.2
East Europe	2.2	1.7	2.1	2.6	2.0
Brazil	1.9	1.4	0.0	0.1	0.1
Egypt	1.9	2.4	1.4	1.0	1.0
Others	10.0	11.3	12.6	11.8	13.3
Total	54.5	56.4	56.8	66.5	67.4
SORGHUM					
Exporters:					
U.S.	4.1	5.1	6.1	8.1	7.0
Argentina	2.2	1.0	1.2	0.5	1.3
Australia	1.1	0.6	0.6	0.5	0.8
Others	1.3	1.2	0.4	1.4	0.9
Total	8.7	8.0	8.2	10.6	10.0
Importers:					
Japan	5.1	4.2	3.9	4.1	4.0
Mexico	0.6	0.8	0.9	2.1	1.2
Taiwan	0.8	0.8	0.3	0.2	0.2
Venezuela	0.8	0.8	1.7	1.6	1.4
Israel	0.5	0.2	0.4	0.4	0.4
USSR	0.1	0.1	0.0	1.2	1.3
Others	0.8	1.1	1.0	1.0	1.5
Total	8.7	8.0	8.2	10.6	10.0
BARLEY					
Exporters:					
EC-12	7.3	6.2	6.9	9.5	9.5
Canada	4.8	6.0	3.4	3.5	4.0
Australia	3.7	2.2	1.6	1.3	1.4
U.S.	0.8	3.0	2.9	1.3	1.3
Others	1.9	1.2	1.0	1.4	1.0
Total	18.4	18.5	15.9	17.0	17.2
Importers:					
Saudi Arabia	6.6	9.0	4.5	4.0	4.5
USSR	2.9	3.0	2.4	3.4	3.3
East Europe	3.3	1.3	1.9	2.4	2.0
Japan	1.5	1.2	1.3	1.2	1.2
Others	4.0	4.1	5.8	6.0	6.2
Total	18.4	18.5	15.9	17.0	17.2
COARSE GRAINS TOTAL TRADE	83.2	84.1	83.1	96.6	96.7

1/ October-September year, excludes intra-EC trade. Totals may not add because of rounding.

In Australia, rains have been heavier than normal through most of the 1989/90 planting and growing season to date. Some of the land that could not be planted to wheat due to excessive moisture was expected to go into barley. Barley production is forecast to rise about 9 percent, but this could be jeopardized if sowings cannot be completed. In addition, the extended period of rains has reportedly prevented the harvest of some of the 1988/89 sorghum crop and drastically lowered the quality of some of the harvest.

Harvesting of South Africa's 1988/89 corn is about complete, and large deliveries to the Maize Board have increased the crop estimate to 11.5 million tons. This is the second highest on record, the result of nearly flawless weather. Production of corn in the previous 5 years averaged just under 7 million tons. The planting of the 1989/90 crop will begin soon. Production is forecast to decline 3 to 4 million tons, assuming a more typical growing season.

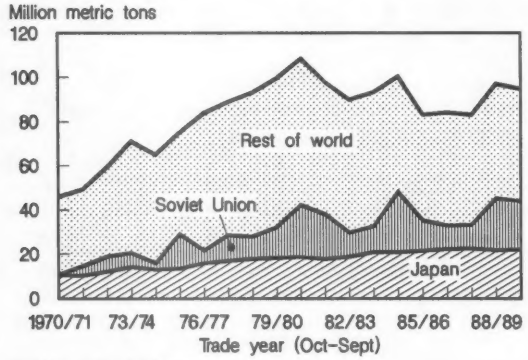
Planting of Argentina's corn and sorghum crops should start soon. Weather conditions for the wheat crop, which was planted earlier, have been excellent to date. Favorable planting conditions and normal weather during the growing season should lead to a big rebound from the drought-reduced 1988/89 crops. Coarse grain production for 1989/90 is projected to be up more than 80 percent to 12.5 million tons. However, even if weather worries ease, the country's unsettled economic situation may restrain planting, unless the new Government is able to create more confidence through its proposed reforms. Planting decisions will also be influenced by relative prices for coarse grains and oilseeds.

Stable Trade Forecast for 1989/90

World coarse grain trade is projected to remain high for 1989/90 at 96.7 million tons, virtually unchanged from the 1988/89 forecast of 96.6 million tons. The 1988/89 forecast was reduced from earlier projections because of smaller prospective purchases by the Soviet Union, Venezuela, and Japan. Meanwhile, the 1989/90 trade forecast was raised because of the reduced prospects for the Soviet 1989/90 grain harvest, leading to a 2-million-ton addition to their projected coarse grain imports.

Hefty imports by the Soviet Union in the last year have been largely responsible for the 13.5-million-ton increase in world coarse grain trade in 1988/89. Forecast Soviet purchases of 23.5 million tons are more than double the 1987/88 level and account for almost 25 percent of world imports. For the coming year, the combination of only a small gain in domestic coarse grain production, lower world coarse grain prices,

Figure 6
Japan and Soviet Union Dominant Coarse Grain Importers



1988/89 and 1989/90 forecast.

continued high feed wheat prices, and efforts to improve the availability of livestock products should mean Soviet coarse grain imports will stay high at a projected 22 million tons while wheat imports fall again.

Imports of sorghum by Venezuela in 1988/89 have fallen well below the record of the year before, forecast down more than a third to 1.1 million tons. This reflects poor economic conditions that have depressed demand for poultry and the subsequent feeding of sorghum as well as changes in exchange rate policies that have increased the cost of imports. The import ban on corn continues, but pressure to import could increase in future months. The domestic corn crop is forecast down more than 30 percent for 1989/90, and this will mean shortages of corn, which is a staple food.

Japan's Import Growth Leveling Off

Since the mid-1960's, Japan has usually been the single largest coarse grain importing country in the world, surpassed in only 5 years by the Soviet Union. Since the early 1980's, Japan's imports have also been larger than the EC (excluding intra-EC trade). For 1989/90, both Soviet and Japanese imports are projected at 22 million tons. However, unlike the large variation of Soviet purchases, Japan historically has been a very consistent buyer.

During 1988/89, however, Japan's imports have slowed and may fall about 3 percent for the year. This could signal the start of a period of flat or declining demand for feed grains in the next few years because of further increases in meat imports. In recent years, Japan's meat imports have risen significantly. From 1986 to 1988, beef and veal (fresh, frozen, and chilled) imports increased 48 percent to 378,000 tons, pork imports 55 percent to 461,000 tons, and poultry 51 percent to 272,000 tons.

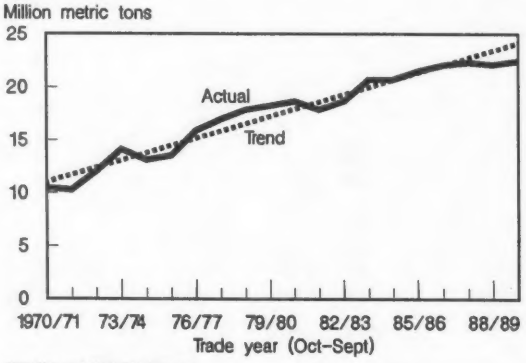
In mid-1988, Japan agreed to liberalize its beef imports, which had been tightly controlled in order to support its domestic beef industry. Various quotas, tariffs, and surcharges administrated through the Japanese Livestock Industry Promotion Corporation keep beef prices artificially high. Despite high prices, per capita beef consumption in Japan has increased by 65 percent over the last decade. But at about 15 pounds per year, Japan's per capita consumption is very low on a world scale and low relative to some other Asian countries.

Given their tastes and preferences and high incomes, Japanese consumers are expected to eat considerably more beef as the market is liberalized and prices fall. The initial steps consist of increasing the import quota by 60,000 tons per year until March 1991, when the quota is removed. This additional beef is expected to come largely from Australia and the United States. Adjustments in tariffs will then be made, with the goal of holding annual beef import increases to less than 20 percent.

This development clearly has the potential to displace some feed grain imports. However, it is impossible to estimate the ultimate results, because of the uncertainty about how the domestic meat and feed industries will adjust to the new market forces. There is also the likelihood of some substitution among meats, particularly beef for pork. This could further complicate analysis of total feed grain demand. As indicated by the slowing pace of imports in recent months, coarse grain imports are not likely to maintain trend growth, and there is a possibility of some decline.

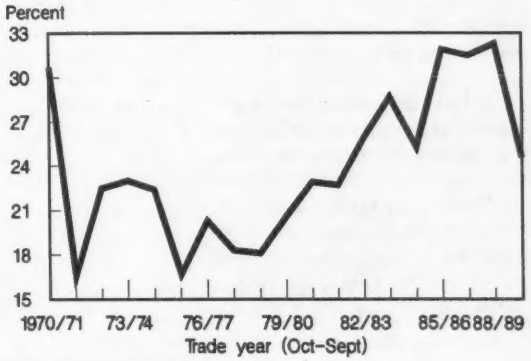
Since Japan is generally the top market for U.S. corn and sorghum, any slowdown in its imports will have a noticeable effect on U.S. exports. Prior to 1988/89, Japan's share of U.S. coarse grain exports by volume had reached 32 percent. It has dropped recently because of the dramatic rise in Soviet

Figure 7
Japan's Coarse Grain Imports Slipping Below Trend



1988/89 and 1989/90 forecast.

Figure 8
Japan's Share of U.S. Coarse Grain Exports



1988/89 based on first 9 months.

purchases. The net impact on U.S. coarse grain use will not necessarily be negative, however, if the increase in exports of fed beef to Japan results in higher total feed grain disappearance in the United States.

Other grain and meat exporters could also be affected by the changes in Japan. If higher beef consumption cuts into pork demand, exports of pork by Taiwan, for example, might also suffer. In Australia, there could be a significant increase in grain feeding, currently small, that could possibly affect the availability of grain for export.

U.S. Exports and Market Share to Recede In 1989/90

Coarse grain exports by the United States are projected at 59.3 million tons for 1989/90, off 3.5 million tons from the forecast 1988/89 level. This implies a drop in the U.S. market share from 65 to 61 percent. Higher competitor exports are forecast because of large anticipated increases in exports by Argentina and South Africa. EC coarse grain exports are projected to drop 1 million tons because of reduced corn shipments. Changes in other competitor exports are forecast to be smaller.

The mix of coarse grains in world trade in 1989/90 is expected to be similar to 1988/89. Declines are projected for sorghum and oats that are offset by increases for corn and barley. Wheat prices in the world market are forecast to remain high and trade in feed quality wheat will continued to be limited. This will bolster demand for coarse grains since export prices for coarse grains are projected to fall.

It is uncertain if recent events in China will lead to changes in its coarse grain trade. China recently purchased a small amount of corn from the United States, marking the first corn purchases in nearly 2 years despite reports of tight feed grain supplies in southern areas of China. China has regularly imported some barley, but this is destined for malting use. Meanwhile China's exports of corn and sorghum are forecast to reach 5 million tons for 1988/89, the highest in 3 years. For 1989/90, these exports are currently projected to fall to 4.5 million tons.

Recent Issues in Grain Quality

by
Mark Ash and Stephanie Mercier
Agricultural Economists, Commodity Economics Division

Abstract: The Grain Quality Improvement Act of 1986 included a general prohibition against recombining or adding dockage or foreign material to any grain once it has been removed. FGIS is considering whether to establish the grade-determining levels of both broken kernels and foreign material or whether FM should be a corn grading factor at all. FGIS set tighter tolerance levels for insect infestation in feed grains and proposed changes in its shiplot inspection plan to strengthen the relationship between the certified grade of a shipment and its true quality. FDA revised their aflatoxin action limits in 1988, and permitted the blending of contaminated corn with uncontaminated corn under FDA supervision. This blending policy only applies to the 1988 corn crop and it is restricted to animal feed use.

Keywords: Feed grains, quality, standards, inspection, aflatoxin

In the early to mid-1980's, competition intensified in international commodity markets and the U.S. market share of world grain exports declined because of a strong dollar, foreign trade subsidies, and domestic prices that were supported well above world market prices. The Food Security Act of 1985 included many provisions to help make U.S. grains competitive, including lower loan rates, generic certificates, and various export promotion programs such as the Export Enhancement Program. However, some have claimed the loss of export share was partly due to foreign complaints about the quality of U.S. grain. Congress responded by amending the U.S. Grain Standards Act with the 1986 Grain Quality Improvement Act (P.L. 99-641).

New rules on grain handling and changes in the grade standards were to be implemented by USDA's Federal Grain Inspection Service (FGIS). In addition to changes mandated by GQIA, FGIS has proposed changes in grain inspection procedures for export grains independent of the Grain Quality Improvement Act. This article summarizes the major provisions affecting feed grains and discusses other efforts to improve grain quality and food safety. New policy decisions pertaining to insect and aflatoxin tolerances will also be discussed.

The Grain Quality Improvement Act identified four objectives on which the changes in grain standards were to be based:

- to define uniform and accepted descriptive terms to facilitate trade;
- to provide information to aid in determining grain storability;
- to offer end users the best possible information from which to determine end product yield and quality; and
- to create the tools for the market to establish incentives for quality improvement.

Quality is defined by the physical, biological, and intrinsic characteristics of the grain. Kernel size and density, moisture content, broken kernels and foreign material, level of insect infestation, and the starch, oil, and protein content are among the many attributes that are used to determine grain storability and value among alternative end uses.

In the past, official grain standards have provided useful descriptions of the physical and sanitary condition of the sample, but little direct information on its intrinsic value and safety for food use. Under current law, data on breakage susceptibility, pesticide or aflatoxin residues must be specifically requested by buyers, if desired. Current standards provide incentives, such as discounts assessed for low test weight, to farmers and plant breeders to select varieties that normally produce higher test weight. But, even after GQIA, there are few incentives to produce grain with other valued attributes.

Rules on Grain Handling Practices

The most significant change dictated by the Grain Quality Improvement Act was the general prohibition against recombining or adding dockage or foreign material to any grain once these items have been removed. Readdition of sweepings and binned grain dust is banned at both country and export elevators. The law excepts the recombination of broken corn or broken kernels with whole grain of the same kind to adjust quality, provided that no foreign material has been added.

Other grain handling practices, such as use of insecticides and fungicides, confetti for grain identification, and application of dust suppressants, are specifically permitted. Exemp-

tions to the recombination of dockage and foreign material prohibition are allowed, upon request, if the grain is sold for final use to domestic users or processors and not resold into commercial markets.

Changes in Grade Standards

Current grain standards have been criticized on the basis that they provide little incentive for genetic improvement and marketing practices. The standards provide no premiums for factors better than the grade allows or for factors omitted from the standards. Unless grain with specific characteristics is contracted for, blending to a uniform quality no better than the required grade limits will result. A complete review of the grade-determining factors and limits has been scheduled for all grain types.

The terminology of grain standards was revised to promote clarity and uniformity among all grains. Following the prohibition on reintroducing foreign material (FM), it became necessary for FGIS to define FM for each grain. Previously, corn and sorghum foreign material were reported on grade certificates in combination with broken kernels as one grade-determining factor, BCFM and BNFM, respectively. Harvesting of high-moisture corn, which may be dried at excessively high temperatures and then moved by high-speed handling equipment, has led to broken corn becoming the major constituent of BCFM. FGIS has created a separate definition of broken corn and foreign material based on particle sizes passing through a series of stacked screens.

Broken corn is now defined as all material that passes a 12/64-inch round hole sieve but remains above a 6/64-inch sieve. Foreign material is the portion that will pass through both screens and the material other than corn that remains on top of the large sieve. Only the material left on top of the small sieve would be permitted to be recombined with grain. Sorghum FM would be defined as all matter except sorghum which passes over a number 6 riddle of a dockage tester and that remains on top of a 5/64-inch triangular-hole sieve. Broken kernels for sorghum are defined as all material that passes through the larger sieve and over a 2.5/64 inch round-hole sieve. Data on the individual components will be determined and reported separately on the inspection log for export shipments and on the official inspection certificate for grain for domestic use. This information is designed to help grain buyers determine the value of grain based on the amount of foreign material.

FGIS is considering whether to establish separate grade-determining levels for both broken kernels and foreign material or whether FM should be a corn grading factor at all. The maximum BCFM limit for U.S. No. 2 corn is currently 3.0 percent (Table A-1). For sorghum, FGIS will decide whether to combine FM and dockage into a single grade-determining factor or deduct both on a weight basis. The maximum limit of broken kernels, foreign material, and other grains for U.S. No. 2 sorghum is currently 8.0 percent (Table A-2).

Separating and tightening the grading factors might promote quality control on the farm and create incentives to clean grain rather than blend at country elevators. The allowances for each factor will determine the grade and the discount. Broken grain, which may be equivalent in value to whole grain, depending on its use, would be discounted much less than FM. If foreign material included all nongrain material and was deducted by weight, there would be little profit in blending differing lots of grain to meet the maximum allowable limits.

Removing foreign material may require additional capital and operating expenses, but elevators may profit by selling the material removed through cleaning as a separate feed ingredient to nearby markets. Additional savings might be achieved through lower drying and aeration costs, fewer insecticide and fungicide expenses, economies in storage and transportation, and lower insurance premiums from the reduced hazard of dust explosion. Ultimately, grain condition and marketability would be enhanced.

Among potential issues will be whether to change the official standards for corn and sorghum to incorporate oil, starch, and protein content as grade-determining factors. A separate "food grade" has been suggested as an outlet for corn varieties tested for a low breakage susceptibility. Segregation of such corn in the grade standards could provide more sanitary grain and better dry milling yields to buyers.

Barley standards were simplified to parallel current barley trading practices. Revisions included: eliminating special grade designations "Tough", "Stained", "Bleached", and "Bright"; removing black barley and smut as grade-determining factors; changing the descriptive terms for damaged kernels; redefining sample grade, damaged kernels, and classes of malting barley. Making barley protein content part of the grade certificate upon request has been approved but implementation is delayed indefinitely.

Moisture adds weight, but no intrinsic value, to grain. However, storability is determined largely by grain moisture. Farmers were assessed discounts for moisture levels above 15.5 percent for corn and 14.0 percent for sorghum. However, premiums were seldom paid for the higher dry matter for grain below the moisture standards. Delivery of grain below the base moisture forfeited the weight of the water that would have been sold for the price of grain. Farmers seldom had the storage space to properly blend on their own. Addition of water to increase grain value is prohibited by the Food and Drug Administration (FDA).

As had been the case for wheat for many years, moisture content was removed as a grade-determining factor for corn and

sorghum in 1985. High-moisture barley and oats is no longer designated as sample grade or with the special grade "Tough". The official grade certificate is required to list the moisture content. Consequently, price was separated from moisture content and determined by a standardized quantity of dry matter. Moisture discounts now apply only to their relation to grain quality, not quantity. A proposal to limit the maximum variation in moisture of blended grains to 4 percent, with the maximum moisture 2 percent above the contracted grade, has been suggested as a way to reduce spoilage. However, new technology to detect moisture variation in blended grain may eliminate the need for a legal limit.

FGIS has implemented other revisions applying to feed grain standards. Dockage for wheat is now reported to the nearest 0.1 percent rather than rounding down to the nearest 0.5 percent. Changing the rounding for sorghum dockage to the nearest 0.5 percent is being considered, instead of the current practice of reporting in whole percents with fractions disregarded. More precise information on dockage and the corresponding weight deduction will better reflect the true value of grain. A reduction from 10 percent to 3 percent in the allowable percentage of brown kernels in yellow sorghum has been considered.

Insect Infestation

FGIS has set tighter tolerance levels for insect infestation in feed grains. The term "weevily," which had been effectively divorced from the grain grades, has been replaced by "infested." The latter designation will be applied to grain samples with two or more live weevils; one live weevil and five or more other live insects (OLI); or ten or more other live insects injurious to stored grain.

The rules do not treat all insects as equally damaging; weevils are considered to have more potential for loss than OLI. Dead insects were not made grade-determining factors. The rules for feed grains were made less restrictive than the insect tolerances in wheat, as only a small percentage of feed grains is used directly in food products. The wheat standards revised the insect tolerance to two live insects and defined sample grade to include a limit of 32 insect-damaged kernels per 100 grams. The latter action would bring the allowance for insect-damaged kernels into compliance with FDA maximum levels for food use.

The presence of insects in stored grain leads to destruction of grain, insect wastes and fragments left in end products, and promotion of mold growth through grain heating. U.S. insect tolerance levels have been the most permissive of the major exporting nations. Customer complaints, both domestic and foreign, have occurred from alleged under-reporting of live insects. Without fumigation, infestation can be exacerbated during storage and shipment. The definition of "infested" would become moot if the grade certificate reported the number of all insects, live and dead. End users would decide how many and what kind of insects are unacceptable.

In 1984, the Environmental Protection Agency banned the liquid fumigant ethylene dibromide (EDB) because of potentially carcinogenic residues left in grain. Since then, reviews of all pesticides have been ordered. Pesticide manufacturers cancelled production of fumigants containing carbon tetrachloride, carbon disulfide, or ethylene dichloride rather than incur the cost of EPA-requested studies on product toxicology. EPA established an action level for EDB residues of 900 parts per billion. FGIS agreed to offer EDB testing to the USSR and Dutch governments. EDB residues have fallen substantially since 1985.

Aluminum phosphides are still available, but approved uses are tightly restricted. EPA requires costly respiratory protective equipment for applicators. Development of insect resistance to malathion has limited its effectiveness. Consequently, acceptable replacements for chemical insect control have been sought. Carbon dioxide or ozone gas, irradiation, biological controls (parasitic wasps), and inert, abrasive dusts like diatomaceous earth have been tested in an attempt to find means of long-term grain protection without harmful residues. However, each method has its disadvantages in cost or performance. Grain cleaning, aeration, and drying are bin management practices capable of preventing buildup of insect populations, but they cannot kill established infestations.

Grain Inspection

All grain that is exported must be inspected to guarantee that shipments conform to grade requirements and contracted specifications. Quality uniformity among sublots is very important because excessive variation from the certified grade average would mean in some cases that some of the export shipment's multiple buyers are purchasing sublots that are below-grade quality. FGIS has proposed changes in its shiplot inspection plan, known as Cu-Sum, to strengthen the relationship between the certified grade of a shipment and its true quality. Test samples are diverted as the grain is being loaded directly onto a ship or to a shipping bin elevator prior to loading.

The revised Cu-Sum (for cumulative sum) plan proposes to lower the limit by which a grading factor may deviate from the average grade standard within a sublot. Each sublot with factor results exceeding the grade limit would add to the cumulative quality score and each sublot below the limit would be subtracted. If the cumulative score exceeds the "breakpoint," the sublot which exceeds the breakpoint and all previous consecutive sublots that exceeded the declared grade limit would be declared off grade. The current plan only regards the last sublot or any sublot within this sequence as unacceptable. For instance, for a shipment of U.S. No. 3 corn, the breakpoint would be 4.3 percent, or 0.3

percent above the grade limit of 4 percent BCFM. Currently, the breakpoint is 0.6 percent.

Another change would limit the number of reinspections or appeals from three to two. A Board appeal would still be allowed. Sampling differences create a greater probability of passing inspection the more times a sublot is reinspected. If the reinspected sublot still does not reduce the original sum below the breakpoint, the sublot would have to be unloaded and replaced to avert having the sublot separately certified. Reinspection results conforming to grade or contract specifications would be averaged with the original inspection to recalculate the Cu-Sum score, unless there were an unusually large grading error. The previous practice replaced all the original sublot results with the reinspection results.

These rules will cause exporters to load grain with lower BCFM and total damaged kernels (DKT). Port elevators that load sublots directly onto ships prior to inspection will seek to avoid the costly expense of unloading. Shippers will likely either clean more grain or blend more closely to meet the factor grade limits.

Grain quality can deteriorate in transit from the time it is certified to when it arrives overseas. Although most contracts still specify the final grade at the point of origin, the destination grade is increasingly used, in which the seller guarantees delivery of an agreed quality at a foreign port. However, buyers must pay more to compensate the seller for the additional responsibilities of insuring quality. FGIS may eventually consider stationing inspectors at foreign ports to validate the certification and arbitrate disputes. Foreign complaint procedures have already been streamlined to provide quicker notification to sellers and shippers.

Aflatoxin

The soil fungus *Aspergillus flavus* produces the naturally occurring toxic substance aflatoxin. Infection of corn crops is greatest when they are stressed during maturation. The contamination can spread significantly under improper storage conditions. Within the United States, this problem has been limited, to occasional outbreaks affecting corn, cottonseed, and peanuts in the Southeast. The severe drought and high temperatures of 1988, however, extended aflatoxin contamination into the Corn Belt, where yields were reduced nearly 40 percent from the 1987 crop.

Scientists are continuing research to develop more reliable detection technologies, limit contamination through detoxification and breeding resistance in plants, and determine the safest maximum utilization levels. Grain moisture content below 12 percent is a fundamental element of controlling toxin formation, as are sanitary bins, daily turning and aeration, and insect control.

Aflatoxin, when ingested by humans in concentrations of more than 20 parts per billion (ppb), is believed by scientists to substantially increase the chance of developing liver cancer. For this reason, corn for food use by humans (about one-fifth of domestic use) is rigorously inspected by food processors for aflatoxin residues. FDA has the power to regulate only contaminated corn shipped in interstate commerce; use within individual States is determined by local statutes. FDA revised their aflatoxin action limits in 1988, and permitted the blending of contaminated corn with uncontaminated corn. This blending policy only applies to the 1988 corn crop and it is restricted to use for animal feeds in the United States.

Corn with aflatoxin levels higher than: 20 ppb for food use, and for feed use by immature animals and lactating dairy animals, or for unknown destinations; 100 ppb for breeding cattle and swine and mature poultry; 200 ppb for finishing swine; and 300 ppb for feedlot cattle would be considered adulterated. Grain above 300 ppb cannot be used for feed purposes. It may, however, be diverted into starch and ethanol production or fertilizer. Wet-milling concentrates the toxin into the residual feed byproducts, which would also restrict their feed use. Grain elevators accepting highly contaminated grain will have to segregate by level to preserve identity of tainted grain, provided they have sufficient storage space. Elevators may blend only if a plan has been approved by FDA and the blending is performed under FDA or State supervision.

Early in the 1988 crop year, large fractions of harvested corn reportedly tested positive for aflatoxin, particularly in the major producing areas hit hardest by the drought. *Feedstuffs* reported as of the first week in October, random testing of corn in Indiana, Iowa, and Illinois found 14-36 percent of the samples to contain more than 20 percent ppb. Widespread concern was expressed, but later tests indicated that infection was more prevalent in early-harvested corn that had suffered the most drought damage.

When it became clear that the 1988 crop would have some problems with aflatoxin, the corn industry and policy makers began to assess the situation. Few processors reported rejecting corn deliveries due to excessive contamination. As reported by (3), samples taken since July 1988 by the Illinois Department of Agriculture showed 48 percent with no contamination, 23.7 percent below 20 ppb, 19.1 percent 21-100 ppb, 6.1 percent 101-300 ppb, and only 2.4 percent over 300 ppb. Most of this grain could be safely directed to approved feed and industrial uses. However, some farmers in affected areas experienced greater difficulty in finding markets which would accept contaminated corn. FGIS reported that 75 percent of export shipments were routinely tested for aflatoxin, and none was rejected for having greater than 20 ppb. The major corn importers, Japan, the USSR, and Mexico, require

testing and specify maximum aflatoxin tolerances in export contracts.

Recent policy discussion has centered around mandating inspection of corn exports for infection, not necessarily to discover tainted corn that might have been missed, but to reassure the public and potential export customers of the safety of the U.S. corn supply. Congress requested a study by the General Accounting Office to determine the extent of aflatoxin in corn, and how U.S. agencies deal with it. A bill was recently introduced in Congress that would reimburse farmers with corn having aflatoxin contamination greater than 300 ppb and compensate for losses in value for corn from 20-300 ppb. The bill also would require establishment of testing standards for contamination at country elevators and mandate testing of all corn exports for aflatoxin.

Conclusions

Quality improvement depends not only on grain standards, which are only one component of the marketing system. The technology of crop harvest, storage, and transportation; weather; varietal development and release; farm and trade policies; and the demand for specific characteristics all interact to determine grain quality.

In preparation for new farm legislation next year, Congress may deliberate on some policy alternatives for enhancing grain quality. Among the potential topics for debate are policies to categorize and indentify grain variety as it enters the market, setting minimum quality specifications and increasing price differentials for grain forfeited to CCC, and mandating inspection of all interstate shipments.

Only the critical factors requested by a sufficient number of market participants should be grade-determining factors. Nongrade-determining or official criteria would be the less important or highly specialized factors. Factors included in grain standards should be evaluated based on whether the value of the market information provided exceeds the cost of grading and segregation. Criteria for testing quality characteristics are that the inspection be relatively quick, simple, repeatable, and inexpensive.

References

(1)Lin, William, and Bruce Wendland. *Proposed Changes in the Cu-Sum Plan: What Will Be the Impact on the U.S. Soybean Industry?* OCS-21. U.S. Dept. Agr., Econ. Res. Serv., Apr. 1989.

(2)Emmet, Julie *Feedstuffs.* Miller Publishing Co. Oct. 17, 1988.

(3)_____, *Feedstuffs.* Miller Publishing Co. Apr. 24, 1989.

(4)National Grain and Feed Association. *Grain Merchandising and Storage in 1987-88.* Chapter 10: "Grain Quality Law and Its Implementation." Aug. 1987.

(5)U.S. Congress, Office of Technology Assessment. *Enhancing the Quality of U.S. Grain for International Trade*, OTA-F-399, Feb. 1989.

(6)_____, Subcommittee on Wheat, Soybeans, and Feed Grains. "United States Grain Standards Act Amendments of 1988; and Preview the Report by the Office of Technology Assessment, 'Technology and Public Policy to Enhance Grain Quality in International Trade'." Prepared for the Committee on Agriculture, U.S. House of Representatives, April 14, 1988.

Table A-1--Current corn grades and grade requirements

Grade	Minimum limits of-		Maximum limits of-	
	Test weight per bushel	Damaged kernels: Heat-damaged kernels	Damaged kernels: Total damaged kernels	Broken corn and foreign material
	Pounds	Percent	Percent	Percent
U.S. No. 1	56.0	0.1	3.0	2.0
U.S. No. 2	54.0	0.2	5.0	3.0
U.S. No. 3	52.0	0.5	7.0	4.0
U.S. No. 4	49.0	1.0	10.0	5.0
U.S. No. 5	46.0	3.0	15.0	7.0

U.S. Sample grade:

U.S. Sample grade is corn that:
(a) Does not meet the requirements for the grades U.S. Nos. 1, 2, 3, 4, or 5; or

(b) Contains more than 8 stones which have an aggregate weight in excess of 0.20 percent of the sample weight, 2 or more pieces of glass, 3 or more crotalaria seeds (Crotalaria spp.), 2 or more castor beans (Ricinus communis L.), 4 or more particles of an unknown foreign substance(s) or a commonly recognized harmful or toxic substance(s), 8 or more cockleburs (Xanthium spp.) or similar seeds singly or in combination, or animal filth in excess of 0.2 percent in 1,000 grams; or

(c) Has a musty, sour, or commercially objectionable foreign odor; or

(d) Is heating, or otherwise of distinctly low quality.

Table A-2--Current sorghum grades and grade requirements

Grade	Minimum limits of- Test weight per bushel	Maximum limits of- Heat-damaged kernels	Total damaged kernels	Broken kernels, foreign material, and other grains
	Pounds	Percent		
U.S. No. 1	57.0	0.2	2.0	4.0
U.S. No. 2	55.0	0.5	5.0	8.0
U.S. No. 3 1/	53.0	1.0	10.0	12.0
U.S. No. 4	51.0	3.0	15.0	15.0

U.S. Sample grade:

U.S. Sample grade shall be sorghum which:
(a) Does not meet the requirements for the grades U.S. Nos. 1, 2, 3, 4; or

(b) Contains 8 or more stones which have an aggregate weight in excess of 0.2 percent of the sample weight, 2 or more pieces of glass, 3 or more crotalaria seeds (Crotalaria spp.), 2 or more castor beans (Ricinus communis L.), 4 or more particles of an unknown foreign substance(s) or a commonly recognized harmful or toxic substance(s), 8 or more cocklebur (Xanthium spp.) or similar seeds singly or in combination, 10 or more rodent pellets, bird droppings, or equivalent quantity of other animal filth per 1,000 grams of sorghum; or

(c) Has a musty, sour, or commercially objectionable foreign odor (except smut odor); or

(d) Is badly weathered, heating, or distinctly low quality.

1/ Sorghum which is distinctly discolored shall be graded not higher than U.S. No. 3.

Table A-3--Current grades and grade requirements for oats

Grade	Minimum limits of- Test weight per bushel	Sound oats	Maximum limits of- Heat-damaged kernels	Foreign material	Wild oats
	Pounds	Percent			
U.S. No. 1	36.0	97.0	0.1	2.0	2.0
U.S. No. 2	33.0	94.0	0.3	3.0	3.0
U.S. No. 3 1/	30.0	90.0	1.0	4.0	5.0
U.S. No. 4 2/	27.0	80.0	3.0	5.0	10.0

U.S. Sample grade:

U.S. Sample grade are oats which:
(a) Does not meet the requirements for the grades U.S. Nos. 1, 2, 3, or 4; or

(b) Contains 8 or more stones which have an aggregate weight in excess of 0.2 percent of the sample weight, 2 or more pieces of glass, 3 or more crotalaria seeds (Crotalaria spp.), 2 or more castor beans (Ricinus communis L.), 4 or more particles of an unknown foreign substance(s) or a commonly recognized harmful or toxic substance(s), 8 or more cocklebur (Xanthium spp.) or similar seeds singly or in combination, 10 or more rodent pellets, bird droppings, or equivalent quantity of other animal filth per 1-1/8 to 1-1/4 quarts of oats; or

(c) Have a musty, sour, or commercially objectionable foreign odor (except smut or garlic odor); or

(d) Are heating, or otherwise of distinctly low quality.

1/ Oats that are slightly weathered shall be graded not higher than U.S. No. 3.

2/ Oats that are badly stained or materially weathered shall be graded not higher than U.S. No. 4.

Table A-4--Current grades and grade requirements for the subclasses Six-Rowed barley, Two-Rowed barley and the class

Grade	Minimum limits of- Test weight per bushel	Sound barley	Maximum limits of- Damaged kernels 1/	Heat damaged kernels	Foreign material	Broken kernels	Thin barley
	Pounds	Percent					
U.S. No. 1	47.0	97.0	2.0	0.2	1.0	4.0	10.0
U.S. No. 2	45.0	94.0	4.0	0.3	2.0	8.0	15.0
U.S. No. 3	43.0	90.0	6.0	0.5	3.0	12.0	25.0
U.S. No. 4 2/	40.0	85.0	8.0	1.0	4.0	18.0	35.0
U.S. No. 5	36.0	75.0	10.0	3.0	5.0	28.0	75.0

U.S. Sample grade:
U.S. Sample grade shall be barley that:
(a) Does not meet the requirements for the grades U.S. Nos. 1, 2, 3, 4, or 5; or

(b) Contains 8 or more stones which have an aggregate weight in excess of 0.2 percent of the sample weight, 2 or more pieces of glass, 3 or more crotalaria seeds (Crotalaria spp.), 2 or more castor beans (Ricinus communis L.), 4 or more particles of an unknown foreign substance(s) or a commonly recognized harmful or toxic substance(s), 8 or more cocklebur (Xanthium spp.) or similar seeds singly or in combination, 10 or more rodent pellets, bird droppings, or equivalent quantity of other animal filth per 1-1/8 to 1-1/4 quarts of barley; or

(c) Has a musty, sour, or commercially objectionable foreign odor (except smut or garlic odor); or

(d) Is heating, or otherwise of distinctly low quality.

1/ Includes heat-damaged kernels. Injured-by-frost kernels and injured-by-mold kernels are not considered damaged kernels.

2/ Barley that is badly stained or materially weathered shall be graded not higher than U.S. No. 4.

History of Farm Income for U.S. Corn Producers

by
Stephanie Mercier and Keith Menzie
Agricultural economist, Economic Research Service, and program analyst, Office of Budget and Program Analysis.

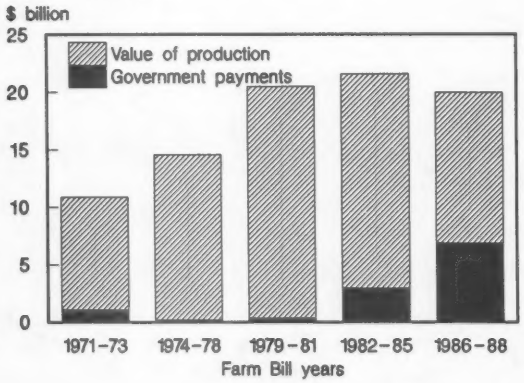
Abstract: For much of the last 50 years, farm income has been supported in varying degrees by U.S. Government programs. Government payments to all farmers under the corn programs have fluctuated from less than $200 million annually in the mid-1970's to over $6 billion annually for the first 3 crop years the 1985 Food Security Act (FSA) was in effect. Corn stocks have been reduced under the FSA (by the 1988 drought and expanding use) and target prices are falling. These factors likely will decrease payments during the last 2 years of the FSA, and increase corn farmers' reliance on market price signals.

Keywords: Farm income, Government payments, corn value of production, commodity programs.

Government policymakers have tried to address low farm income, commodity price stability, and maintenance of adequate food supplies through agricultural policies and farm programs since the early part of this century. The economic problems faced by the farm sector during the Depression of the 1930's added to public concern for a stable food supply; legislation was therefore enacted to ensure both adequate farm income and ample food supplies from one year to the next. The agricultural programs and policies of the 1930's formed the basis for the programs that have followed.

This article reviews the effects agricultural commodity programs have had on farm income of corn producers since 1970. Total revenue for corn producers (or farm income) is defined in this analysis as the sum of value of production (corn production times season average market price) and direct Government payments received by U.S. corn producers. All annual figures (crop value of production and Government payments) are based on the corn crop year. For example, the 1987 corn crop year ran from September 1, 1987 to August 30, 1988. Direct payments are defined as the sum of deficiency, diversion, disaster, and reserve storage payments. These Government payments do not include any Commodity Credit Corporation (CCC) outlays on loans. Over the last two decades, the portion of farm income coming from Government programs has fluctuated widely, ranging from less than $100 million in 1975 to $7.7 billion in 1987. In fact, the share of Government payments contribute to farm income has risen steadily since the 1980/81 crop year (table B-1).

B-1
Components of Farm Income for Corn Producers



The Agricultural Act of 1970

Enacted during a period of relatively high Government expenditures, the Agricultural Act of 1970 addressed two major issues. First, responding to concerns about the size of payment checks going to large farms, Congress included in the Act a payment limitation of $55,000 per person per crop. This limitation excluded nonrecourse loan payments. Second, the 1970 Act introduced set-asides, which required farmers to retire a portion of their base acreage to be eligible for government payments but did not restrict which crops could be planted on the remaining land. All the other basic programs affecting corn producers remained intact from farm legislation passed during the 1960's, such as loan rates at or below world prices, direct price support payments, and diversion payments.

The Act was in effect for the 1971/72-1973/74 crop years. Farm program payments for the 1970 crop accounted for 19 percent of corn farm income. The early 1970's were characterized by rising crop yields but lower production because of acreage retirement under the program. Set-aside acres formerly planted to corn increased 71 percent between 1971/72 and 1972/73, from 14 million to 24.4 million acres. This reduction, along with a 57-percent increase in corn exports in 1972/73 that was sustained in 1973/74, boosted market prices in both 1972/73 and 1973/74.

Table 8-1--Composition of farm income for U.S. corn producers, 1970-88 crop years

Year	Farm Value prod.	Defic. payments	Divers. payments	Disaster payments	Reserve storage payments	Total payments	Total revenue	Payment Share in Revenue
	$ million							Percent
1970 Act:								
1971	6,101	893	0	0	39	932	7,033	13.2
1972	8,743	1,143	325	0	29	1,498	10,241	16.6
1973	14,463	910	0	0	27	937	15,400	6.1
1973 Act:								
1974	14,232	0	0	244	0	244	14,499	1.7
1975	14,819	0	0	90	0	90	14,930	0.6
1976	13,524	0	0	181	0	181	13,717	1.3
1977	13,107	0	0	281	0	281	13,467	2.1
1977 Act:								
1978	16,281	88	558	153	37	836	17,117	4.9
1979	19,661	0	111	16	223	349	20,010	1.7
1980	20,714	0	0	280	-72	208	20,922	1.0
1981	20,054	0	0	92	364	456	20,510	2.2
1981 Act:								
1982	20,999	291	0	1	625	917	21,916	4.2
1983	13,402	0	904	0	22	1/926	14,328	6.5
1984	20,183	1,653	0	0	100	1,753	21,937	8.0
1985	19,795	2,479	0	9	165	2,644	22,439	11.8
1985 Act:								
1986	12,792	6,030	120	0	519	6,669	19,461	34.2
1987	13,228	5,874	1,416	0	447	7,737	20,965	36.9
1988 2/	12,646	2,300	560	909	307	4,076	16,722	24.4

1/ Payment-in-kind not included. 2/ Estimated.

Higher corn prices sharply boosted the value of production over the period. In nominal dollars, this figure rose more than $8 billion between 1971/72 and 1973/74 — more than 130 percent. While Government payments increased between 1971/72 and 1972/73, they fell to only 6 percent of corn total revenue in 1973/74. The Government payment growth in 1972/73 was largely due to diversion payments of more than $300 million, because diverted acres rose substantially. In the 1972/73 crop year, stocks dropped due to extremely high export demand generated in part by increased Soviet imports.

The Agriculture and Consumer Protection Act of 1973

The 1973 Act established target prices based on production costs to replace support payments and included, for the first time, a deficiency payment which varied with the season average market price. This change allowed the price support and income functions to be separated, because income support payments depended on market prices. Higher prices meant lower deficiency payments, and farmers who entered the program were not guaranteed a payment unless the season average market price fell below the target price. The 1973 Act reduced the $55,000 annual payment limit to $20,000, and covered the 1974-77 crops.

The Act was in effect during a period of high corn prices and increasing exports. Yields climbed from about 72 bushels per acre in 1974 to almost 91 in 1977. With planted acres rising as well (though at a slower rate), total corn output grew impressively over most of this period, excluding the drought-reduced 1974 crop.

Rising output and decreasing prices during 1974-77 kept corn value of production between $13 and $15 billion each year. Although declining, prices continued to exceed the target price, thus precluding the need for deficiency payments during this time. Disaster payments, authorized for the first time under the 1973 Act for participants who were unable to plant or whose yields were lowered by natural disasters such as droughts and floods, accounted for nearly all Government direct payments to corn farmers for the 1974/75-1977/78 crop years. Government payments to producers averaged $199 million a year — 1.4 percent of total corn revenue.

The 1977 Food and Agriculture Act

Under the 1977 Act, the concept of determining deficiency payments by acreage allotments, which had been used as far back as the 1950's, was replaced by a calculation based on normal production from current plantings. In addition, this Act established the Farmer-Owned Reserve (FOR), which encouraged farmers to store grain for 3-5 years or until market price reached a specified release level. The farmer received storage payments for the grain, and the loan accrued interest for only the first year of the agreement.

The 4 crop years covered by the 1977 Act, 1978-81, were characterized by rapidly expanding stocks. At the beginning of the 1978/79 crop year, corn stocks stood at 1.4 billion bushels. Despite a drought in 1980 that reduced corn output 16 percent from the previous year, an overall increase in production for the period boosted 1981/82 ending stocks to 2.5 billion bushels. Relatively high market prices, combined with climbing loan rates and target prices, contributed to the stock buildup.

Domestic demand during 1978-81 remained fairly static and could not keep up with rapidly growing supplies. Target prices increased from $2.10 to $2.70 per bushel, and loan rates rose from $2.00 to $2.55 per bushel from the 1978 through the 1982 crop year. Some of that increase was granted to compensate farmers for losses they may have experienced as a result of the U.S. embargo on grain exports to the Soviet Union, imposed in early 1980. Exports also jumped during this period, exceeding 2 billion bushels for all years covered by the 1977 Act.

Except for the 1978/79 crop year, relatively high prices during 1978-81 precluded deficiency payments. FOR storage payments, disaster payments, and diversion payments accounted for most of the Government spending on all agricultural programs. Total payments to corn producers in 1978 equaled $836 million, but averaged less than $500 million for the life of the 1977 Act.

In 1978/79, diversion payments totaled $558 million, and FOR storage payments were $37 million. In 1980, disaster payments accounted for all Government payments to corn producers; in 1981, storage payments reached $364 million. The FOR, which held no corn at the end of 1980/81, stood at 1.3 billion bushels at the end of the 1981/82 marketing year because the FOR loan rate was more favorable than the basic 9-month loan rate, and farmers were allowed to enter corn directly in the FOR after harvest. Market receipts accounted for at least 95 percent of corn producers' total income in all years of this period.

The Agricultural and Food Act of 1981

The 1981 Act specified that target prices for the 1982-85 corn crops be not less than $2.70, $2.86, $3.03, and $3.18 per bushel, respectively. Subsequently, legislation (specifically, the Agricultural Programs Adjustment Act of 1984) froze the target price at $3.03 a bushel. The act also set the basic loan rate (minimum price support) at $2.55 a bushel, which was adjusted in a budget reconciliation bill in 1982 for the 1983 crop. Congress anticipated that strong exports and domestic demand would continue to support corn prices and that rapid inflation would keep the cost of production up. Crop-specific acreage bases were established to allow USDA to be more selective in controlling crop production.

The relatively high corn prices that had prevailed during the life of the 1977 Act, boosted by the 1980 drought, fell substantially in the 1981/82 crop year. Ending stocks grew from 1.4 billion bushels at the beginning of 1981/82 to 3.5 billion (nearly 50 percent of use) by the end of 1982/83. The payment-in-kind (PIK) program and the 1983 drought temporarily reduced ending stocks and raised market prices for the 1983/84 marketing year. However, by the end of the 1985/86 marketing year, stocks had rebounded to 4.0 billion bushels.

The period covered by the 1981 Act marked the beginning of substantial increases in Government outlays for agricultural programs, and corn producers received a continually larger share of them. Corn producers received $917 million during 1982/83—about a third of total payments. Still, market receipts accounted for 96 percent of corn producers' income in that year. During 1983/84 (if PIK payments are included), 1984/85, and 1985/86, payments to corn producers climbed steadily, reaching $2.6 billion in 1985/86. By 1985/86, the last crop year covered under the 1981 Act, the corn crop's value had declined to 88 percent of total corn producers' farm income. Deficiency payments constituted the major category of program payments that year, totaling just under $2.5 billion due to target prices above $3.00 per bushel, a record 8.9-billion-bushel corn crop, and consequently lower market prices (season average price of $2.23 a bushel).

The 1985 Farm Bill

As the 1981 Act approached expiration in 1985, Congress faced several concerns in constructing a new farm bill. These included: declining exports and export market share, large Government stocks, and severe financial stress among some farmers due to the sharp decline in land values of the early 1980's.

Program payments received as a percentage of farm income from the sale of corn grew steadily from the mid-1970's. During the period the 1981 Act was in force, direct Government payments to corn producers averaged more than $1.5 billion, or about 8 percent of gross corn revenue.

Congress devised the 1985 Food Security Act (FSA) to provide a safety net for farm income and boost U.S. exports. It stated no explicit goal regarding the composition of farm income, but implied that, with increased export opportunities and lower loan rates, U.S. producers would eventually be more inclined to produce for the market rather than for commodity programs.

Programs under the 1985 FSA to make U.S. grain producers more competitive in the world market, along with a fall in the value of the U.S. dollar, restored much of the U.S. agricultural export market share by 1988/89. Corn exports showed particularly large gains, from 1.2 billion bushels in 1985 to 2.1 billion in 1988. Farm prices dropped from $2.23 per bushel in 1985/86 to $1.50 in 1986/87 before rising again as stocks dropped and yields were cut sharply by the 1988 drought.

Lower prices in 1986/87 can be largely attributed to the mandated decline in the loan rate and the issuance and aggressive use of generic certificates (which were redeemable for regular and FOR loans and grain in CCC stocks), causing season average corn prices to fall. Target prices were frozen at $3.03 per bushel by law for 1986-87, so expected per bushel deficiency payments reached a historical high. Total pro-

gram payments to corn producers climbed 153 percent from 1985 to 1986, and expanded an additional 16 percent in 1987.

At the same time, relatively high ARP requirements caused corn production to drop while farm prices fell, considerably reducing market proceeds for corn. The 20-percent ARP requirement in 1986 withdrew an additional 8 million acres from corn production compared with 1985. These additional idled acres cut the crop 800-1,000 million bushels, most of which would have ended up in Government stocks. The value of corn production decreased 35 percent between 1985 and 1986, but recovered slightly in 1987. Thus, program payments as a percentage of total corn revenue jumped over 20 percentage points for the first 2 years of the 1985 FSA.

If the Corn Belt had experienced near normal precipitation and temperatures in 1988, corn program costs would likely have declined somewhat from the 2 previous years. USDA estimates in May 1988, published before the severe drought became apparent, projected the 1988/89 corn crop at 7.3 billion bushels and a season average price of $1.82 per bushel. The figures implied a crop valued at just over $13 billion, which would have been consistent with crop values for 1986/87 and 1987/88. With such a harvest, Government costs would have been around $5.4 billion, primarily in the form of deficiency payments (according to 1988 pre-drought Congressional Budget Office estimates).

The drought cut U.S. corn production by about one-third from the May estimates, to 4.9 billion bushels. The resulting decline in supply pushed up market prices substantially. In fact, corn prices are expected to rise so high that overall value of production for 1988/89 will be similar to what it had been predicted to be without the drought, about $12.6 billion (7.3 billion bushels at $1.82 a bushel). Exports are projected to increase to 2.1 billion bushels, and stocks reduced. Government payments are expected to be somewhat lower than what they would have been in 1988/89 with normal weather, just over $4 billion. A major difference exists in the breakdown of those payments. Although expected deficiency payments have been cut in half, a large portion of that reduction is being made up in the form of disaster relief payments. The share of Government payments in total farm revenue for corn producers is projected to be similar (under 30 percent) between the year that might have been and the year that was. This share was down 10-12 percentage points from the previous 2 years.

Conclusions

If current programs are maintained with only minor changes in the new farm legislation, market equilibrium price will eventually approach the declining target price, and farmers will respond more to market conditions. Thus, Congressional debate over agricultural policy over the next few years will clearly be of interest to corn producers.

LIST OF TABLES

Table **Page**

1. Feed grains: Supply, disappearance, and ending stocks, June/May, 1980/81-1989/90 4
2. Corn supply and use, March-May 5
3. Corn: Feed, seed, and industrial use 10
4. World coarse grain trade: Major exporters and importers by commodity, 1985/86-1989/90 13

Appendix tables

1. Feed grains: Marketing year supply and disappearance, 1984/85-1989/90 27
2. Foreign coarse grains: Supply and disappearance, 1980/81-1989/90 28
3. Corn: Marketing year supply and disappearance, area, and prices, 1984/85-1989/90 29
4. Sorghum: Marketing year supply and disappearance, area, and prices, 1984/85-1989/90 30
5. Barley: Marketing year supply and disappearance, area, and prices, 1984/85-1989/90 31
6. Oats: Marketing year supply and disappearance, area, and prices, 1984/85-1989/90 32
7. Corn: Marketing year supply and disappearance, specified periods, 1983/84-1989/90 33
8. Sorghum: Marketing year supply and disappearance, specified periods, 1982/83-1989/90 34
9. Barley: Marketing year supply and disappearance, specified periods, 1983/84-1989/90 35
10. Average prices received by farmers, United States, by month, and loan rate, 1982-1989 36
11. Cash prices at principal markets, 1985-1989 37
12. Feed-price ratios for livestock, poultry, and milk, by months, 1982-1989 38
13. Price trends, selected feeds, and corn products 39
14. Corn, sorghum, barley, and oats exports, 1986/87 to date 40
15. Corn, sorghum, barley, and oats imports, 1986/87 to date 41
16. Shipments of grain on the Illinois Waterway and the Mississippi River (Locks 11-22), 1981/82-1988/89 . 42
17. Barge rates for grain shipments to New Orleans, Louisiana 42
18. Weekly average of rail car loadings of grain and soybeans, 1979/80-1988/89 42
19. Rail freight rate index for grain, Crop year 1979 to 1988 (December 1984=100) 43
20. Hay (all): Acreage, supply, and disappearance, 1983/84-1989/90 43
21. Hay: Average prices received by farmers, United States by months, 1983/84-1989/90 44
22. Processed feeds: Quantity fed, 1986/87 to date 45

Appendix table 1--Feed grains: Marketing year supply and disappearance, 1984

Year 2/	Supply				Dom	
	Beginning stocks	Production	Imports	Total	Food, alcohol, and industrial	S
						Mil
1984/85	39.6	236.9	0.8	277.3	30.6	
1985/86	57.5	274.4	0.9	332.7	33.5	
1986/87	126.3	252.3	0.7	379.4	34.3	
1987/88	152.1	215.4	1.1	368.6	35.6	
1988/89 4/	133.6	149.2	1.4	284.2	36.6	
1989/90 4/	63.4	217.6	1.1	282.1	---38.9--	

	Area		
	Set-aside and diverted	Planted	Harvested for grain
	----------Million hectares----------		
1984/85	2.1	49.5	43.2
1985/86	2.9	51.8	45.1
1986/87	7.3	48.5	41.3
1987/88	12.5	43.1	35.1
1988/89	11.1	41.1	32.5
1989/90	6.2	42.8	37.3

1/ Aggregated data on corn, sorghum, barley, and oats. 2/ The marketing ye barley, June 1. 3/ Includes total Government loans (original and reseal). 4 7/ Deficiency and diversion payments.

ce, 1984/85-1989/90 1/

Disappearance					Ending stocks		
Domestic use							
d, and al	Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 3/	Total
Million metric tons							
	1.5	131.1	163.2	56.6	219.8	8.9	48.6	57.5
	1.5	134.8	169.8	36.6	206.4	20.4	105.9	126.3
	1.2	145.5	181.0	46.3	227.3	48.8	103.3	152.1
	1.2	145.5	182.3	52.6	234.9	34.1	99.5	133.6
	1.3	120.1	158.0	62.8	220.8	19.9	43.5	63.4
--38.9---		127.9	166.8	59.1	225.9			56.2

vested for rain	Yield per harvested hectare	Index Average price received by farmers 5/	Government-support program Total payments to participants
---	Metric tons	1977=100	$ million
3.2	5.48	130	6/ 1,860
5.1	6.07	108	6/ 2,785
1.3	6.11	78	7/ 7,343
5.1	6.13	97	7/ 8,928
2.5	4.59		
7.3			

eting year for corn and sorghum begins September 1; for oats and eal). 4/ Projected. 5/ Excludes support payments. 6/ Deficiency payments.

Appendix table 2--Foreign coarse grains: Supply and disappearance, 1980/81-1989/90 1/

Year	Beginning stocks	Production	Feed	Total Disappearance	Imports	Adjusted imports 2/	Ending stocks
			Million metric tons				
Corn:							
1980/81	45.8	240.1	168.4	298.0	79.1	78.1	48.9
1981/82	48.9	235.1	175.9	291.3	77.6	67.3	43.8
1982/83	43.8	230.3	174.6	281.5	73.2	63.3	39.1
1983/84	39.1	241.4	167.7	288.9	64.9	61.1	39.8
1984/85	39.8	263.9	183.6	303.6	72.5	66.6	47.4
1985/86	47.4	254.3	186.2	291.7	62.1	54.5	41.2
1986/87	41.2	268.4	195.3	310.5	61.1	56.4	37.2
1987/88	37.2	267.7	196.2	310.5	63.1	56.8	38.3
1988/89 3/	38.3	273.6	212.9	327.2	74.1	66.5	38.0
1989/90 4/	38.0	277.4	217.4	330.9	72.8	67.4	35.2
Sorghum:							
1980/81	6.9	44.6	23.3	50.8	12.8	14.1	8.1
1981/82	8.1	48.1	28.5	55.5	14.3	13.7	7.4
1982/83	7.4	44.0	25.2	50.5	12.3	11.6	6.1
1983/84	6.1	46.5	25.8	52.4	13.1	13.0	6.5
1984/85	6.5	44.1	26.2	52.1	12.9	13.1	6.0
1985/86	6.0	41.9	25.0	47.4	9.6	8.7	5.0
1986/87	5.0	40.6	23.3	46.4	8.1	8.0	4.2
1987/88	4.2	37.2	22.3	44.2	8.6	8.2	3.1
1988/89 3/	3.1	41.6	24.7	47.7	10.8	10.6	4.6
1989/90 4/	4.6	42.9	25.2	49.6	10.1	10.0	4.8
Barley:							
1980/81	16.9	155.4	107.5	156.6	16.3	13.8	17.1
1981/82	17.1	144.9	105.4	149.6	20.4	13.9	14.4
1982/83	14.4	155.6	107.8	152.9	17.2	13.1	17.9
1983/84	17.9	153.6	115.4	160.4	20.3	16.4	12.9
1984/85	12.9	162.5	115.8	157.8	23.1	18.0	19.1
1985/86	19.1	165.1	120.3	161.8	22.3	18.4	22.6
1986/87	22.6	169.1	125.7	167.9	24.1	18.5	26.7
1987/88	26.7	169.1	126.2	173.1	19.9	15.9	25.2
1988/89 3/	25.2	160.0	120.4	162.3	21.1	17.0	24.4
1989/90 4/	24.4	155.4	121.6	161.2	21.7	17.2	19.7
Total coarse grains: 5/							
1980/81	77.4	534.0	342.0	600.3	110.3	108.1	81.5
1981/82	81.5	520.3	351.7	588.6	114.5	97.5	72.8
1982/83	72.8	533.6	357.2	585.8	104.0	89.5	73.2
1983/84	73.2	551.0	364.6	609.2	100.2	92.8	70.8
1984/85	70.8	578.1	377.4	618.9	111.2	99.6	85.9
1985/86	85.9	568.4	387.4	608.7	95.8	82.2	81.2
1986/87	81.2	582.7	396.9	628.0	95.2	83.4	81.4
1987/88	81.4	575.6	396.6	629.1	93.5	81.9	79.5
1988/89 3/	79.5	580.0	407.5	642.1	107.7	95.1	78.9
1989/90 4/	78.9	581.7	416.4	647.1	106.2	95.5	71.4

1/ Aggregated on basis of local marketing years, except for adjusted imports. 2/ Based on Oct./Sept. trade year and excludes intra-EC trade. 3/ Preliminary. 4/ Forecast. 5/ Includes oats, rye, millet, and mixed grains.

Source: Compiled from World Grain Situation and Outlook, Foreign Agricultural Service, and USDA data.

Appendix table 3--Corn: Marketing year supply and disappearance, area, and prices

Year beginning September 1	Supply				Domestic	
	Beginning stocks	Production	Imports	Total	Food, alcohol, and industrial	Seed
						Million
1984/85	1,006.3	7,674.0	3.5	8,683.8	1,070.0	21.2
1985/86	1,648.2	8,876.7	10.6	10,535.5	1,140.0	19.5
1986/87	4,039.5	8,249.9	2.1	12,291.5	1,175.0	16.7
1987/88	4,881.7	7,072.1	4.0	11,957.8	1,212.0	17.2
1988/89 2/	4,259.1	4,921.2	5.0	9,185.3	1,236.3	18.7
1989/90 2/	1,830.3	7,348.0	3.0	9,181.3	---1,300.0---	

	Area			Yield per harvested acre		
	Set-aside and diverted	Planted	Harvested for grain		Received by farmers 3/	S
	Million acres			Bushels		
1984/85	3.9	80.5	71.9	106.7	2.63	
1985/86	5.4	83.4	75.2	118.0	2.23	
1986/87	14.3	76.7	69.2	119.3	1.50	
1987/88	23.0	65.7	59.2	119.4	1.94	
1988/89	20.5	67.6	58.2	84.6	2.50-2.60	4
1989/90	10.0	72.3	65.2			

1/ Includes quantity under loan and farmer-owned reserve. 2/ Projected. 3/ Ex
5/ Deficiency payments. 6/ Deficiency and diversion payments. 7/ Deficiency, di

nd prices, 1984/85-1989/90

Disappearance					Ending stocks Aug. 30		
Domestic use			Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
Seed	Feed and residual	Total					
Million bushels							
21.2	4,079.0	5,170.2	1,865.4	7,035.6	224.9	1,423.3	1,648.2
19.5	4,095.3	5,254.8	1,241.2	6,496.0	545.7	3,493.8	4,039.5
16.7	4,713.7	5,905.4	1,504.4	7,409.8	1,443.2	3,438.5	4,881.7
17.2	4,735.0	5,964.2	1,734.5	7,698.7	835.0	3,424.1	4,259.1
18.7	4,000.0	5,255.0	2,100.0	7,355.0	400.0	1,430.3	1,830.3
.0---	4,200.0	5,500.0	2,000.0	7,500.0			1,681.0

Average prices				Government-support program		
ived / rs 3/	St. Louis No. 2 yellow	Omaha No. 2 yellow	Gulf Ports No. 2 yellow	National average loan rate	Target price	Total payments to participants
	$/bu.					$ million
53	2.81	2.65	3.00	2.55	3.03	5/ 1,654
23	2.37	2.25	2.52	2.55	3.03	5/ 2,479
50	1.68	1.53	1.83	1.92	3.03	6/ 7,213
94	2.19	1.98	2.40	1.82	3.03	6/ 7,321
2.60	4/ 2.78	4/ 2.53	4/ 2.97	1.77	2.93	7/ 4,260
				1.65	2.84	

. 3/ Excludes support payments. 4/ September 1988-June 1989 average.
ency, diversion, and disaster payments.

Appendix table 4--Sorghum: Marketing year supply and disappearance, area, and pric

Year beginning September 1	Supply				Domesti	
	Beginning stocks	Production	Imports	Total	Food, alcohol, and industrial	Seed
					Million	
1984/85	287.4	866.2	0.1	1,153.7	15.3	2.0
1985/86	300.2	1,120.3	---	1,420.5	26.0	1.7
1986/87	551.0	938.1	---	1,489.1	10.4	1.5
1987/88	743.3	739.2	---	1,482.5	23.5	1.3
1988/89 2/	662.7	577.6	---	1,240.3	---25.0---	
1989/90 2/	440.0	664.0	---	1,104.0	---15.0---	

	Area			Yield per harvested acre		
	Set-aside and diverted	Planted	Harvested for grain		Received by farmers 3/	Kan
	Million acres			Bushels		
1984/85	0.6	17.3	15.4	56.4	4.15	
1985/86	0.9	18.3	16.8	66.8	3.45	
1986/87	2.3	15.3	13.9	67.7	2.45	
1987/88	4.1	11.8	10.6	69.9	2.79	
1988/89	3.9	10.4	9.1	63.8	4/ 4.11	4/
1989/90	2.8	11.9	10.5	63.1	1.65-2.05	

--- = Not applicable.
1/ Includes quantity under loan and farmer-owned reserve. 2/ Projected. 3/ Exc
5/ Deficiency payments. 6/ Deficiency and diversion payments. 7/ Deficiency, div

and prices, 1984/85-1989/90

	Disappearance				Ending stocks Aug. 30		
-Domestic use-							
Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
illion bushels							
2.0	539.3	556.6	296.9	853.5	112.1	188.1	300.2
1.7	663.8	691.5	178.0	869.5	207.2	343.8	551.0
1.5	535.6	547.5	198.3	745.8	409.0	334.3	743.3
1.3	563.7	588.5	231.3	819.8	463.6	199.1	662.7
0---	475.0	500.0	300.0	800.0	355.0	85.0	440.0
0---	500.0	515.0	275.0	790.0			314.0

Average prices				Government-support program		
ved 3/	Kansas City No. 2 yellow	Texas No. 2 yellow	Gulf Ports No. 2 yellow	National average loan rate	Target price	Total payments to participants
			$/cwt.			$ million
5	4.46	5.04	4.90	4.32	5.14	5/ 158
5	3.72	4.32	4.07	4.32	5.14	5/ 228
5	2.73	3.24	3.21	3.25	5.14	6/ 585
9	3.40	3.81	3.96	3.11	5.14	6/ 699
1	4/ 4.21	4/ 4.71	4/ 4.94	3.00	4.96	7/ 335
2.05						

3/ Excludes support payments. 4/ September 1988-June 1989 average.
ncy, diversion and disaster payments.

Appendix table 5--Barley: Marketing year supply and disappearance, area, and prices,

Year beginning June 1	Supply				Domestic	
	Beginning stocks	Production	Imports	Total	Food, alcohol, and industrial	Seed
						Million bus
1984/85	189.4	599.2	10.1	798.7	149.0	21.4
1985/86	247.4	591.4	8.9	848.8	147.2	21.3
1986/87	324.8	610.5	8.7	944.0	156.1	17.9
1987/88	335.6	529.5	13.6	878.7	158.3	15.7
1988/89 2/	321.2	290.5	11.7	623.4	164.7	15.0
1989/90 2/	196.8	392.1	15.0	603.9	```180.0```	

	Area			Yield per harvested acre		
	Set-aside and diverted	Planted	Harvested for grain		Received by farmers 3/	No. bet fe
	Million acres			Bushels		
1984/85	0.5	12.0	11.2	53.4	2.29	2.
1985/86	0.7	13.2	11.6	51.0	1.98	1.
1986/87	1.8	13.1	12.0	50.8	1.61	1.
1987/88	2.9	11.0	10.1	52.6	1.81	1.
1988/89	2.8	9.7	7.5	38.6	2.79	2.
1989/90	2.1	9.3	8.6	45.8		

1/ Includes quantity under loan and farmer-owned reserve. 2/ Projected. 3/ Exclu
5/ Deficiency payments. 6/ Deficiency and diversion payments.

prices, 1984/85-1989/90

Disappearance					Ending stocks May 31		
Domestic use			Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
Feed	Feed and residual	Total					
lion bushels							
1.4	304.1	474.5	76.8	551.3	15.6	231.8	247.4
1.3	332.6	501.1	21.8	522.9	57.4	267.4	324.8
7.9	297.8	471.8	136.6	608.4	75.5	260.1	335.6
5.7	257.4	431.4	126.1	557.5	50.1	271.1	321.2
5.0	162.2	341.9	84.7	426.6	30.4	166.4	196.8
	190.0	370.0	60.0	430.0			174.0

Average prices				Government-support program		
Minneapolis		Portland				
/	No. 2 or better feed 4/	No. 3 or better malting	No. 2	National average loan rate	Target price	Total payments to participants
	$/bu.					$ million
	2.09	2.55	2.59	2.08	2.60	5/ 50
	1.53	2.24	2.23	2.08	2.60	5/ 160
	1.44	1.89	1.97	1.56	2.60	6/ 356
	1.78	2.04	2.09	1.49	2.60	6/ 333
	2.31	4.11	2.74	1.44	2.51	6/ 45
				1.34	2.43	

/ Excludes support payments. 4/ Starting March 1987, shifted to Duluth.

Appendix table 6--Oats: Marketing year supply and disappearance, area, an

Year beginning June 1	Supply				Food, alcohol, and industrial
	Beginning stocks	Production	Imports	Total	
1984/85	181.1	473.7	34.0	688.8	41.0
1985/86	179.9	520.8	27.5	728.2	44.0
1986/87	183.7	386.4	33.3	603.4	45.0
1987/88	132.7	374.0	46.3	553.0	45.0
1988/89 2/	112.0	218.8	68.4	399.2	70.4
1989/90 2/	98.3	380.7	50.0	529.0	---110.

	Area			Yield per harvested acre	Recei by farmer
	Set-aside and diverted	Planted	Harvested for grain		
	Million acres			Bushels	
1984/85	0.1	12.4	8.2	58.0	1.6
1985/86	0.1	13.3	8.2	63.7	1.2
1986/87	0.4	14.7	6.9	56.0	1.2
1987/88	0.8	18.0	6.9	54.0	1.5
1988/89	0.3	13.9	5.6	39.1	2.0
1989/90	0.3	12.1	7.3	52.3	

NA = Not available.
1/ Includes quantity under loan and farmer-owned reserve. 2/ Projected
5/ Deficiency and diversion payments.

rea, and prices, 1984/85-1989/90

Disappearance						Ending stocks May 31		
Domestic use				Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
Food, el, and strial	Seed	Feed and residual	Total					
Million bushels								
.0	34.6	432.0	507.6	1.3	508.9	1.4	178.5	179.9
.0	38.4	459.9	542.3	2.2	544.5	1.9	181.8	183.7
.0	30.6	392.3	467.9	2.8	470.7	3.5	129.2	132.7
.0	34.0	360.5	439.5	1.5	441.0	3.5	108.5	112.0
.4	29.6	199.6	299.6	1.3	300.9			98.3
---110.0---		300.0	410.0	2.0	412.0			117.0

Average prices				Government-support program		
Received by farmers 3/	Minneapolis No. 2 white, heavy	Portland No. 2 white, heavy	Toledo No. 2	National average loan rate	Target price	Total payments to participants
$/bu.						$ million
1.67	1.81	2.12	1.92	1.31	1.60	NA
1.23	1.31	1.60	1.08	1.31	1.60	4/ 8
1.21	1.46	1.53	1.20	0.99	1.60	5/ 34
1.56	1.92	1.76	1.68	0.94	1.60	5/ 27
2.61	2.80		2.26	0.90	1.55	4/ 2
				0.85	1.50	

rojected. 3/ Excludes support payments. 4/ Deficiency payments.

Appendix table 7--Corn: Marketing year supply and disappearance, specified periods,

Year beginning September 1	Supply				Di		
	Beginning stocks	Production	Imports	Total	Domestic use		
					Food, alcohol, and industrial	Seed	Fe and resi
							Million bushels
1983/84:							
Sept.-Nov.	3,523.1	4,174.7	0.5	7,698.3	238.6	---	1,31
Dec.-Feb.	5,651.7	---	0.6	5,652.3	222.8	---	1,05
Mar.-May	3,865.0	---	1.0	3,866.0	247.3	16.8	93
June-Aug.	2,145.1	---	0.6	2,145.7	247.3	2.3	51
Mkt. year	3,523.1	4,174.7	2.7	7,700.5	956.0	19.1	3,81
1984/85:							
Sept.-Nov.	1,006.3	7,674.0	0.9	8,681.2	249.7	---	1,29
Dec.-Feb.	6,631.1	---	0.4	6,631.5	241.5	---	1,18
Mar.-May	4,623.2	---	1.1	4,624.3	283.8	17.0	1,00
June-Aug.	2,835.5	---	1.1	2,836.6	295.0	4.2	59
Mkt. year	1,006.3	7,674.0	3.5	8,683.8	1,070.0	21.2	4,07
1985/86:							
Sept.-Nov.	1,648.2	8,876.7	1.0	10,525.9	278.0	---	1,21
Dec.-Feb.	8,614.7	---	1.3	8,616.0	264.0	---	1,29
Mar.-May	6,587.1	---	2.3	6,589.4	293.0	16.1	1,08
June-Aug.	4,990.0	---	6.0	4,996.0	305.0	3.4	49
Mkt. year	1,648.2	8,876.7	10.6	10,535.5	1,140.0	19.5	4,09
1986/87:							
Sept.-Nov.	4,039.5	8,249.9	0.8	12,290.2	280.0	---	1,38
Dec.-Feb.	10,305.5	---	0.3	10,305.8	270.0	---	1,47
Mar.-May	8,248.2	---	0.5	8,248.7	310.0	16.4	1,08
June-Aug.	6,332.2	---	0.5	6,332.7	315.0	0.3	76
Mkt. year	4,039.5	8,249.9	2.1	12,291.5	1,175.0	16.7	4,71
1987/88:							
Sept.-Nov.	4,881.7	7,072.1	0.6	11,954.4	292.0	---	1,49
Dec.-Feb.	9,771.0	---	0.9	9,771.9	282.0	---	1,44
Mar.-May	7,635.6	---	1.6	7,637.2	315.0	16.7	95
June-Aug.	5,835.5	---	0.9	5,836.4	323.0	0.5	83
Mkt. year 2/	4,881.7	7,072.1	4.0	11,957.8	1,212.0	17.2	4,73
1988/89:							
Sept.-Nov.	4,259.1	4,921.2	0.7	9,181.0	294.0	---	1,33
Dec.-Feb.	7,071.6	---	1.5	7,073.1	284.0	---	1,07
Mar.-May	5,203.9	---	1.9	5,205.8	322.2	16.8	84
June-Aug.							
Mkt. year 2/	4,259.1	4,921.2	5.0	9,185.3	1,236.3	18.7	4,00
1989/90:							
Mkt. year 3/	1,830.3	7,348.0	3.0	9,181.3	---1,300.0---		4,20

--- = Not applicable.
1/ Includes quantity under loan and farmer-owned reserve. 2/ Preliminary. 3/ Pro

eriods, 1983/84-1989/90

Disappearance				Ending stocks		
c use						
Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
bushels						
1,311.0	1,549.6	497.0	2,046.6	227.0	4,424.7	5,651.7
1,056.0	1,278.8	508.5	1,787.3	214.0	2,651.0	3,865.0
939.5	1,203.6	517.3	1,720.9	195.0	1,950.1	2,145.1
511.1	760.7	378.7	1,139.4	201.5	804.8	1,006.3
3,817.6	4,792.7	1,901.5	6,694.2	201.5	804.8	1,006.3
1,294.2	1,543.9	506.2	2,050.1	206.7	6,424.4	6,631.1
1,182.9	1,424.4	583.9	2,008.3	209.7	4,413.5	4,623.2
1,009.1	1,309.9	478.9	1,788.8	221.7	2,613.8	2,835.5
592.8	892.0	296.4	1,188.4	224.9	1,423.3	1,648.2
4,079.0	5,170.2	1,865.4	7,035.6	224.9	1,423.3	1,648.2
1,215.5	1,493.5	417.7	1,911.2	388.6	8,226.1	8,614.7
1,299.6	1,563.6	465.3	2,028.9	509.4	6,077.7	6,587.1
1,085.9	1,395.0	204.4	1,599.4	550.9	4,439.1	4,990.0
494.3	802.7	153.8	956.5	545.7	3,493.8	4,039.5
4,095.3	5,254.8	1,241.2	6,496.0	545.7	3,493.8	4,039.5
1,384.0	1,664.0	321.1	1,985.1	968.2	9,337.3	10,305.5
1,471.8	1,742.2	315.4	2,057.6	1,362.2	6,886.0	8,248.2
1,089.9	1,416.3	500.2	1,916.5	1,491.5	4,840.7	6,332.2
768.0	1,083.3	367.7	1,451.0	1,443.2	3,438.5	4,881.7
4,713.7	5,905.4	1,504.4	7,409.8	1,443.2	3,438.5	4,881.7
1,493.4	1,785.4	398.0	2,183.4	1,683.4	8,087.6	9,771.0
1,446.0	1,728.0	408.3	2,136.3	1,767.7	5,867.9	7,635.6
956.2	1,287.9	513.8	1,801.7	1,304.9	4,530.6	5,835.5
839.4	1,162.9	414.4	1,577.3	835.0	3,424.1	4,259.1
4,735.0	5,964.2	1,734.5	7,698.7	835.0	3,424.1	4,259.1
1,333.5	1,627.5	481.9	2,109.4	611.0	6,459.9	7,071.6
1,076.9	1,360.9	508.3	1,869.2	465.0	4,738.9	5,203.9
847.6	1,186.6	600.2	1,786.8			3,419.0
4,000.0	5,255.0	2,100.0	7,355.0	400.0	1,430.3	1,830.3
4,200.0	5,500.0	2,000.0	7,500.0			1,681.0

3/ Projected.

Appendix table 8--Sorghum: Marketing year supply and disappearance, specified perio

Year beginning September 1	Supply				Domesti	
	Beginning stocks	Production	Imports	Total	Food, alcohol, and industrial	Seed
					Million bush	
1982/83:						
Sept.-May	318.6	835.1	0.0	1,153.7	6.0	0.9
June-Aug.	529.1	0.0	0.0	529.1	1.9	0.9
Mkt. year	318.6	835.1	0.0	1,153.7	7.9	1.8
1983/84:						
Sept.-May	439.1	487.5	0.0	926.6	5.7	1.1
June-Aug.	368.9	0.0	0.1	369.0	2.0	1.2
Mkt. year	439.1	487.5	0.1	926.7	7.7	2.3
1984/85:						
Sept.-May	287.4	866.2	0.1	1,153.7	12.4	1.5
June-Aug.	360.8	0.0	0.0	360.8	2.9	0.5
Mkt. year	287.4	866.2	0.1	1,153.7	15.3	2.0
1985/86:						
Sept.-May	300.2	1,120.3	0.0	1,420.5	22.1	1.2
June-Aug.	630.0	0.0	0.0	630.0	3.9	0.5
Mkt. year	300.2	1,120.3	0.0	1,420.5	26.0	1.7
1986/87:						
Sept.-May	551.0	938.1	0.0	1,489.1	8.2	1.0
June-Aug.	835.0	0.0	0.0	835.0	2.2	0.5
Mkt. year	551.0	938.1	0.0	1,489.1	10.4	1.5
1987/88:						
Sept.-May	743.3	739.2	0.0	1,482.5	14.2	0.8
June-Aug.	807.8	0.0	0.0	807.8	9.3	0.5
Mkt. year 2/	743.3	739.2	0.0	1,482.5	23.5	1.3
1988/89:						
Sept.-May	662.7	577.6	0.0	1,240.3	17.0	0.8
June-Aug.						
Mkt. year 3/	662.7	577.6	0.0	1,240.3	---25.0---	
1989/90:						
Mkt. year 3/	440.0	664.0	0.0	1,104.0	---15.0---	

1/ Includes quantity under loan and farmer-owned reserve. 2/ Preliminary. 3/ Pr

ed periods, 1982/83-1989/90

Disappearance					Ending stocks		
-Domestic use-							
Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
ion bushels							
0.9	453.5	460.4	164.2	642.6	54.0	475.1	529.1
0.9	41.3	44.1	45.9	90.0	171.5	267.6	439.1
1.8	494.8	504.5	210.1	714.6	171.5	267.6	439.1
1.1	356.5	363.3	194.4	557.7	78.0	290.9	368.9
1.2	28.2	31.4	50.2	81.6	102.8	184.6	287.4
2.3	384.7	394.7	244.6	639.3	102.8	184.6	287.4
1.5	542.2	556.1	236.8	792.9	111.1	249.7	360.8
0.5	(2.9)	0.5	60.1	60.6	112.1	188.1	300.2
2.0	539.3	556.6	296.9	853.5	112.1	188.1	300.2
1.2	626.9	650.2	140.3	790.5	181.4	447.5	630.0
0.5	36.9	41.3	37.7	79.0	207.2	343.8	551.0
1.7	663.8	691.5	178.0	869.5	207.2	343.8	551.0
1.0	490.1	499.3	154.8	654.1	400.4	434.6	835.0
0.5	45.5	48.2	43.5	91.7	409.0	334.3	743.3
1.5	535.6	547.5	198.3	745.8	409.0	334.3	743.3
0.8	474.4	489.4	185.3	674.7	535.0	272.8	807.8
0.5	89.3	99.1	46.0	145.1	463.6	199.1	662.7
1.3	563.7	588.5	231.3	819.8	463.6	199.1	662.7
0.8	426.2	444.0	237.8	681.8	363.8	194.7	558.5
--	475.0	500.0	300.0	800.0	355.0	85.0	440.0
--	500.0	515.0	275.0	790.0			314.0

. 3/ Projected.

Appendix table 9--Barley: Marketing year supply and disappearance, specified perio

Year beginning September 1	Supply				Domestic use	
	Beginning stocks	Production	Imports	Total	Food, alcohol, and industrial	Seed
						Million bushel
1983/84:						
June-Aug.	216.7	508.9	2.8	728.4	42.5	0.0
Sept.-Nov.	---	---	1.4	1.4	35.0	1.4
Dec.-Feb.	---	---	1.5	1.5	34.6	1.6
Mar.-May	---	---	1.4	1.4	40.0	16.5
Mkt. year	216.7	508.9	7.1	732.7	152.1	19.5
1984/85:						
June-Aug.	189.4	599.2	3.1	791.7	39.9	0.0
Sept.-Nov.	639.0	---	1.6	640.6	34.6	1.5
Dec.-Feb.	484.9	---	3.2	488.1	34.2	1.7
Mar.-May	358.7	---	2.2	360.9	40.3	18.2
Mkt. year	189.4	599.2	10.1	798.7	149.0	21.4
1985/86:						
June-Aug.	247.4	591.4	1.4	840.2	39.1	0.0
Sept.-Nov.	698.3	---	2.0	700.3	33.7	1.5
Dec.-Feb.	572.1	---	3.2	575.3	33.7	1.7
Mar.-May	464.7	---	2.3	467.0	40.7	18.1
Mkt. year	247.4	591.4	8.9	847.7	147.2	21.3
1986/87:						
June-Aug.	324.8	610.5	1.9	937.2	42.2	0.0
Sept.-Nov.	786.8	---	1.7	788.5	36.5	1.3
Dec.-Feb.	634.3	---	1.8	636.1	35.8	1.4
Mar.-May	499.3	---	3.3	502.6	41.6	15.2
Mkt. year	324.8	610.5	8.7	944.0	156.1	17.9
1987/88:						
June-Aug.	335.6	529.5	1.5	866.6	42.8	0.0
Sept.-Nov.	725.0	---	3.8	728.8	37.1	1.1
Dec.-Feb.	582.4	---	5.0	587.4	36.3	1.3
Mar.-May	458.5	---	3.3	461.8	42.1	13.3
Mkt. year 2/	335.6	529.5	13.6	878.7	158.3	15.7
1988/89:						
June-Aug.	321.2	290.5	3.1	614.8	45.2	0.0
Sept.-Nov.	450.7	---	2.6	453.3	39.4	1.1
Dec.-Feb.	372.4	---	3.1	375.5	37.2	1.2
Mar.-May	280.8	---	2.9	283.7	42.9	12.7
Mkt. year 1/	321.2	290.5	11.7	623.4	164.7	15.0
1989/90:						
Mkt. year 2/	196.8	392.1	15.0	603.9	```180.0```	

--- = Not applicable.
1/ Preliminary. 2/ Projected.

ed periods, 1983/84-1989/90

Disappearance					Ending stocks		
tic use							
	Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
n bushels							
.0	100.2	142.7	9.2	151.9	8.5	568.0	576.5
.4	88.1	124.5	31.4	155.9	10.7	411.3	422.0
.6	49.6	85.8	29.5	115.3	12.0	296.2	308.2
.5	42.4	98.9	21.3	120.2	11.9	177.5	189.4
.5	280.3	451.9	91.4	543.3	11.9	177.5	189.4
.0	100.6	140.5	12.2	152.7	12.2	626.8	639.0
.5	83.2	119.3	36.4	155.7	13.0	471.9	484.9
.7	69.9	105.8	23.6	129.4	14.2	344.5	358.7
.2	50.4	108.9	4.6	113.5	15.6	231.8	247.4
.4	304.1	474.5	76.8	551.3	15.6	231.8	247.4
.0	92.0	131.1	10.8	141.9	20.0	678.3	698.3
.5	85.4	120.6	7.6	128.2	36.1	536.0	572.1
.7	73.3	108.7	1.9	110.6	47.3	417.4	464.7
.1	81.9	140.7	1.5	142.2	57.4	267.4	324.8
.3	332.6	501.1	21.8	522.9	57.4	267.4	324.8
.0	93.8	136.0	14.4	150.4	56.0	730.8	786.8
.3	72.6	110.4	43.8	154.2	66.2	568.1	634.3
.4	67.2	104.4	32.4	136.8	75.2	424.1	499.3
.2	64.2	121.0	46.0	167.0	75.5	260.1	335.6
.9	297.8	471.8	136.6	608.4	75.5	260.1	335.6
.0	81.1	123.9	17.7	141.6	74.9	650.1	725.0
.1	62.8	101.0	45.4	146.4	79.5	502.9	582.4
.3	58.1	95.7	33.2	128.9	57.0	401.5	458.5
.3	55.4	110.8	29.8	140.6	50.1	271.1	321.2
.7	257.4	431.4	126.1	557.5	50.1	271.1	321.2
.0	92.2	137.4	26.7	164.1	35.9	414.8	450.7
.1	26.1	66.6	14.3	80.9	35.9	336.5	372.4
.2	40.0	78.4	16.3	94.7	34.1	246.7	280.8
.7	3.9	59.5	29.4	88.9	30.4	166.4	196.8
.0	162.2	341.9	84.7	426.6	30.4	166.4	196.8
	190.0	370.0	60.0	430.0			174.0

Appendix table 10--Average prices received by farmers, United States, by month, and loan rate, 1982-1989 1/

Year	Sept	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average 2/	Loan rate
						$/bu.								
Corn:														
1982	2.15	1.98	2.13	2.26	2.36	2.56	2.71	2.95	3.03	3.04	3.13	3.35	2.55	2.55
1983	3.32	3.15	3.17	3.15	3.15	3.11	3.21	3.32	3.34	3.36	3.30	3.12	3.21	2.65
1984	2.90	2.65	2.55	2.56	2.64	2.62	2.67	2.70	2.68	2.64	2.60	2.44	2.63	2.55
1985	2.29	2.11	2.21	2.29	2.33	2.32	2.29	2.30	2.39	2.32	2.00	1.73	2.23	2.55
1986	1.45	1.40	1.47	1.50	1.48	1.42	1.47	1.52	1.66	1.69	1.60	1.47	1.50	1.92
1987	1.49	1.55	1.61	1.72	1.77	1.83	1.86	1.88	1.94	2.41	2.72	2.65	1.94	1.82
1988	2.60	2.58	2.51	2.53	2.60	2.58	2.59	2.56	2.58	2.52 3/	2.43			1.77
						$/cwt.								
Sorghum:														
1982	3.80	3.70	3.78	3.97	4.09	4.42	4.67	4.92	5.05	5.05	5.03	5.29	4.41	4.32
1983	5.26	5.01	4.98	4.93	4.92	4.74	4.85	5.00	5.08	4.94	4.64	4.58	4.89	4.50
1984	4.24	4.05	4.05	4.15	4.16	4.10	4.24	4.46	4.54	4.52	4.04	3.74	4.15	4.32
1985	3.27	3.30	3.47	3.76	3.69	3.55	3.67	3.80	3.99	3.43	3.06	2.66	3.45	4.32
1986	2.36	2.34	2.38	2.41	2.37	2.36	2.45	2.58	2.69	2.79	2.66	2.52	2.45	3.25
1987	2.43	2.48	2.69	2.72	2.75	2.88	2.92	2.94	2.90	4.13	4.56	4.41	3.04	3.11
1988	4.24	4.17	3.98	3.99	4.09	4.05	4.03	4.16	4.02	3.90 3/	4.01			1.68

Year	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Average 2/	Loan rate
						$/bu.								
Oats:														
1982	1.88	1.57	1.39	1.35	1.32	1.40	1.44	1.46	1.48	1.49	1.54	1.54	1.49	1.31
1983	1.51	1.46	1.45	1.55	1.62	1.67	1.73	1.81	1.88	1.81	1.82	1.84	1.62	1.36
1984	1.80	1.68	1.62	1.60	1.69	1.64	1.72	1.74	1.69	1.68	1.68	1.60	1.67	1.31
1985	1.59	1.31	1.16	1.10	1.08	1.17	1.20	1.18	1.16	1.14	1.13	1.21	1.23	1.31
1986	1.10	0.90	0.86	0.99	1.11	1.32	1.44	1.46	1.47	1.45	1.50	1.57	1.21	0.99
1987	1.52	1.29	1.40	1.49	1.60	1.62	1.76	1.79	1.84	1.78	1.82	1.84	1.56	0.94
1988	2.68	2.86	2.58	2.56	2.56	2.42	2.46	2.52	2.46	2.40	2.24	2.14	2.62	0.90
1989	1.82 3/	1.65												
All barley:														
1982	2.39	2.16	2.20	2.17	1.98	2.06	2.19	2.16	2.00	2.09	2.22	2.36	2.18	2.08
1983	2.32	2.20	2.34	2.46	2.53	2.55	2.55	2.55	2.47	2.50	2.54	2.78	2.47	2.16
1984	2.61	2.54	2.26	2.25	2.29	2.25	2.19	2.24	2.21	2.18	2.16	2.22	2.29	2.08
1985	2.14	2.08	1.98	1.88	1.96	2.05	2.07	2.05	1.95	1.88	1.85	1.73	1.98	2.08
1986	1.57	1.67	1.51	1.45	1.58	1.69	1.62	1.60	1.63	1.69	1.69	1.76	1.61	1.56
1987	1.74	1.84	2.00	1.87	1.73	1.88	1.83	1.78	1.72	1.65	1.74	1.79	1.81	1.49
1988	2.46	2.97	2.79	2.88	2.86	2.95	2.74	2.68	2.66	2.74	2.74	2.63	2.79	1.44
1989	2.33 3/	2.21												

Year	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
						$/bu.						
Feed barley:												
1982	2.52	2.23	1.98	1.91	1.87	1.94	1.98	2.07	1.99	2.08	2.26	2.43
1983	2.52	2.31	2.23	2.41	2.45	2.51	2.52	2.58	2.47	2.54	2.55	2.86
1984	2.72	2.60	2.10	2.13	2.19	2.19	2.20	2.22	2.27	2.19	2.16	2.30
1985	2.26	2.05	1.75	1.74	1.85	1.90	2.03	2.00	1.90	1.83	1.85	1.81
1986	1.61	1.44	1.21	1.33	1.49	1.62	1.59	1.56	1.61	1.69	1.71	1.84
1987	1.79	1.67	1.54	1.57	1.66	1.68	1.63	1.65	1.64	1.59	1.73	1.76
1988	2.07	2.34	2.33	2.39	2.34	2.30	2.27	2.29	2.34	2.35	2.32	2.27
1989	2.14 3/	2.10										
Malting barley:												
1982	2.26	2.10	2.38	2.58	2.22	2.26	2.39	2.32	2.00	2.09	2.13	2.18
1983	2.05	2.06	2.50	2.69	2.72	2.61	2.61	2.50	2.47	2.46	2.54	2.53
1984	2.52	2.48	2.50	2.52	2.52	2.39	2.18	2.29	2.11	2.17	2.17	2.10
1985	2.02	2.13	2.49	2.33	2.24	2.32	2.19	2.13	1.99	1.93	1.85	1.66
1986	1.52	2.07	2.23	1.85	1.83	1.78	1.65	1.70	1.69	1.69	1.65	1.66
1987	1.68	2.04	2.55	2.39	1.88	2.07	2.01	2.15	1.80	1.69	1.76	1.81
1988	2.80	3.27	3.37	3.44	3.41	3.34	3.27	3.24	3.22	3.22	3.16	3.04
1989	2.62 3/	2.50										

1/ Prices do not include an allowance for loans outstanding and Government purchases. 2/ U.S. season average prices based on monthly prices weighted by monthly marketings. 3/ Preliminary.

Source: Agricultural Prices, Agricultural Statistics Board, USDA.

Appendix table 11--Cash prices at principal markets, 1985-1989

Year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average
						$/bu.							
Corn, no. 2 yellow, Central Illinois:													
1985	2.28	2.10	2.32	2.36	2.36	2.33	2.29	2.31	2.42	2.41	1.93	1.52	2.22
1986	1.34	1.34	1.55	1.52	1.44	1.38	1.46	1.56	1.75	1.74	1.60	1.46	1.51
1987	1.52	1.65	1.74	1.78	1.85	1.89	1.92	1.92	1.97	2.59	2.90	2.73	2.04
1988	2.70	2.71	2.56	2.60	2.65	2.60	2.65	2.57	2.63 4/	2.53			
Corn, no. 2 yellow, Gulf Ports:													
1985	2.59	2.50	2.69	2.75	2.72	2.63	2.56	2.57	2.68	2.63	2.12	1.85	2.52
1986	1.68	1.66	1.83	1.81	1.73	1.70	1.83	1.89	2.06	2.06	1.95	1.81	1.83
1987	1.86	2.00	2.08	2.11	2.32	2.23	2.30	2.28	2.29	3.05	3.22	3.02	2.40
1988	3.08	3.07	2.89	2.99	3.01	2.99	3.02	2.93	2.99	2.87			
Corn, no. 2 yellow, St. Louis:													
1985	2.38	2.27	2.50	2.59	2.55	2.50	2.42	2.46	2.56	2.52	2.01	1.67	2.37
1986	1.47	1.46	1.68	1.69	1.61	1.57	1.65	1.74	1.93	1.92	1.79	1.65	1.68
1987	1.65	1.78	1.91	1.97	2.05	2.07	2.09	2.10	2.13	2.77	2.96	2.81	2.19
1988	2.82	2.82	2.70	2.76	2.81	2.79	2.82	2.76	2.83	2.70			
Sorghum, no.2 yellow, Gulf Ports 1/:													
1985	3.70	3.97	4.34	4.52	4.45	4.30	4.28	4.50	4.80	3.90	3.37	2.71	4.07
1986	2.95	3.15	3.26	3.16	3.03	3.04	3.34	3.28	3.51	3.47	3.30	3.04	3.21
1987	3.13	3.35	3.56	3.49	3.64	3.80	3.86	3.72	3.63	5.17	5.17	5.05	3.96
1988	5.00	4.91	4.64	4.93	4.99	4.99	5.02	4.89	5.05	4.75			
						$/cwt							
Sorghum, no. 2 yellow, Kansas City:													
1985	3.56	3.62	3.75	3.97	3.95	3.80	3.82	4.00	4.25	4.00	3.20	2.71	3.72
1986	2.47	2.60	2.70	2.62	2.50	2.57	2.80	2.85	3.10	3.20	2.80	2.55	2.73
1987	2.64	2.75	2.90	2.95	3.05	3.24	3.27	3.16	3.21	4.58	4.79	4.28	3.40
1988	4.27	4.17	4.00	4.23	4.24	4.26	4.32	4.17	4.29	4.15			
Sorghum, no. 2 yellow, Texas High Plains:													
1985	4.19	4.38	4.30	4.49	4.47	4.36	4.33	4.48	4.77	4.84	3.93	3.36	4.32
1986	3.35	3.24	2.97	3.06	2.94	2.89	3.06	3.32	3.56	3.60	3.58	3.30	3.24
1987	3.19	3.27	3.27	3.39	3.40	3.53	3.56	3.54	3.55	4.84	5.25	4.96	3.81
1988	4.98	4.95	4.62	4.63	4.75	4.69	4.72	4.63	4.50	4.59			

Year	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Average
						$/bu.							
Barley, no. 3 or better malting, 65% or better plump, Minneapolis:													
1985	2.46	2.25	2.03	2.15	2.10	2.27	2.29	2.28	2.20	2.34	2.40	2.07	2.24
1986	1.84	1.75	1.61	1.76	1.93	2.02	1.88	1.81	1.92	2.01	2.05	2.12	1.89
1987	2.07	1.93	1.73	1.98	2.08	2.05	2.01	2.02	2.15	2.08	2.11	2.24	2.04
1988	3.61	3.87	4.25	4.40	4.39	4.14	3.82	4.14	4.19	4.33	4.29	3.84	4.11
1989	3.02												
Barley, no. 2 feed, Minneapolis 2/, 3/:													
1985	1.90	1.66	1.46	1.40	1.41	1.49	1.60	1.57	NA	NA	NA	1.31	1.53
1986	1.23	1.16	1.13	1.27	1.50	1.63	1.23	NA	NA	1.64	1.76	1.86	1.44
1987	1.73	1.59	1.60	1.76	1.78	1.82	1.74	1.72	1.77	1.88	1.94	1.98	1.78
1988	2.41	2.31	2.08	2.24	2.32	2.27	2.14	2.24	2.33	2.49	2.52	2.41	2.31
1989	2.12												
Oats, no. 2 heavy white, Minneapolis:													
1985	1.59	1.44	1.23	1.24	1.19	1.32	1.39	1.37	1.30	1.27	1.16	1.22	1.31
1986	1.18	1.05	1.12	1.29	1.39	1.72	1.66	1.64	1.56	1.46	1.59	1.83	1.46
1987	1.64	1.61	1.77	1.85	1.97	2.05	2.02	2.10	2.06	1.93	1.94	2.12	1.92
1988	3.26	3.25	3.09	3.07	2.99	2.71	2.74	2.87	2.59	2.49	2.30	2.22	2.80
1989	2.03												

NA = Not available.
NQ = No quotes.
1/ Rail delivered to Texas Gulf. 2/ Prior to June 1977 reported as barley, no. 3 or better. 3/ Reporting point changed from Minneapolis #2 feed to Duluth #2 feed beginning March 1987. 4/ Preliminary.

Source: Grain and Feed Market News, Agricultural Marketing Service, USDA.

Appendix table 12--Feed-price ratios for livestock, poultry, and milk, by months, 1982-1989

Year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average
Hog/corn, U.S. basis 1/:													
1982	28.5	28.2	24.6	23.7	23.4	21.9	18.6	15.9	15.1	14.4	13.9	13.9	20.2
1983	13.3	12.8	11.8	14.0	15.4	14.6	14.3	14.3	14.1	14.6	15.8	16.2	14.3
1984	16.0	16.5	18.4	19.0	18.2	18.4	16.3	15.3	15.4	16.9	17.6	17.4	17.1
1985	17.3	20.4	19.5	19.8	19.0	18.4	17.6	17.3	19.2	22.7	29.5	35.9	21.4
1986	40.2	37.9	35.9	33.7	32.1	33.9	32.2	33.4	31.9	34.7	37.3	39.9	35.3
1987	36.4	31.3	25.1	23.4	24.3	25.0	22.7	22.3	23.7	19.5	16.2	17.1	23.9
1988	15.7	15.0	14.4	15.7	15.7	15.7	15.2	14.4	16.1	17.9 2/	18.9		
Beef-steer/corn, Omaha 3/:													
1982	27.5	27.7	25.1	25.2	24.5	23.4	22.7	21.9	21.8	21.2	19.6	18.1	23.2
1983	17.8	18.4	18.3	19.8	21.6	22.1	21.1	20.4	19.7	19.1	20.4	20.7	20.0
1984	21.3	22.4	24.6	25.6	24.8	24.1	22.2	21.5	21.5	21.0	20.4	21.7	22.6
1985	21.8	25.7	27.8	26.7	25.6	24.4	24.0	22.9	23.0	22.3	28.9	36.7	25.8
1986	42.1	42.7	39.7	38.8	40.8	43.9	41.9	42.2	40.2	38.9	41.4	43.9	41.4
1987	42.1	41.4	38.4	36.7	36.4	37.4	38.2	39.4	38.6	29.5	24.4	26.1	35.7
1988	26.4	26.4	28.4	27.9	28.1	28.7	29.4	30.2	29.3	29.1 2/	29.4		
Milk/feed, U.S. basis 4/:													
1982	1.57	1.61	1.62	1.60	1.59	1.56	1.55	1.49	1.45	1.43	1.45	1.41	1.53
1983	1.36	1.39	1.36	1.34	1.33	1.33	1.34	1.32	1.32	1.32	1.35	1.40	1.35
1984	1.48	1.56	1.62	1.59	1.57	1.57	1.55	1.51	1.47	1.45	1.44	1.47	1.52
1985	1.51	1.56	1.55	1.53	1.52	1.50	1.48	1.48	1.46	1.45	1.51	1.55	1.51
1986	1.61	1.75	1.77	1.77	1.74	1.69	1.63	1.62	1.58	1.55	1.56	1.60	1.66
1987	1.65	1.65	1.65	1.63	1.52	1.48	1.43	1.40	1.37	1.36	1.15	1.17	1.45
1988	1.25	1.32	1.36	1.37	1.37	1.34	1.30	1.28	1.27	1.28 2/	1.35		
Egg/feed, U.S. basis 5/:													
1982	6.0	6.3	6.3	6.0	5.7	5.8	6.1	5.8	6.0	5.8	5.7	6.1	6.0
1983	6.0	6.2	6.9	7.7	8.8	8.5	7.4	8.6	6.5	5.8	5.8	5.8	7.0
1984	5.9	5.7	6.5	6.3	5.4	5.6	6.3	5.7	5.5	5.9	5.8	6.5	5.9
1985	7.1	7.3	7.5	7.4	7.2	6.9	7.6	6.4	6.4	5.7	6.9	7.3	7.0
1986	7.3	7.0	8.0	7.9	7.2	7.1	6.6	6.7	6.7	6.1	5.8	5.7	6.8
1987	6.7	6.1	6.6	5.8	5.6	5.3	5.8	5.2	4.9	5.2	4.9	4.9	5.5
1988	5.4	5.3	5.4	5.4	5.9	5.8	7.5	6.2	5.9	6.0 2/	6.1		
Broiler/feed, U.S. basis 6/:													
1982	2.6	2.5	2.5	2.5	2.6	2.7	2.4	2.3	2.4	2.6	2.8	2.8	2.6
1983	2.7	2.5	2.8	2.9	3.1	3.1	3.1	2.7	2.7	2.7	3.0	2.7	2.8
1984	2.8	2.6	2.8	2.7	2.9	2.9	2.8	2.8	3.1	3.2	3.1	3.1	2.9
1985	3.2	3.1	3.5	3.2	3.2	3.1	3.1	3.1	3.4	3.7	4.5	4.6	3.4
1986	3.8	4.4	3.9	3.5	3.6	3.5	3.3	3.2	3.3	3.0	2.9	3.3	3.5
1987	2.9	2.6	2.7	2.5	2.8	2.6	2.8	3.1	3.7	4.1	3.4	3.4	3.1
1988	3.2	2.8	2.7	2.8	2.9	2.9	3.2	3.2	3.8	3.6 2/	3.3		
Turkey/feed, U.S. basis 7/:													
1982	3.8	3.9	3.9	3.0	2.9	2.9	2.9	2.7	2.9	3.0	2.8	2.8	3.1
1983	3.0	3.0	3.1	3.5	3.6	3.2	3.3	3.3	3.3	3.3	3.6	3.8	3.3
1984	3.9	4.4	5.0	5.5	4.7	3.8	3.7	3.7	3.7	3.8	4.2	4.5	4.2
1985	5.0	5.5	5.5	5.5	3.4	3.4	3.5	3.8	3.5	4.3	4.5	4.6	4.4
1986	4.7	4.9	4.8	4.0	3.3	3.4	3.6	3.5	3.3	3.3	3.1	2.9	3.7
1987	2.8	2.8	3.1	3.6	2.8	2.6	2.5	2.7	2.8	3.0	2.9	3.1	2.9
1988	3.4	3.6	3.6	2.9	2.7	2.9	3.1	3.3	3.4	3.5 2/	3.3		

1/ Bushels of corn equal in value to 100 pounds of hog, live weight. 2/ Preliminary. 3/ Based on price of choice beef-steers, 900-1100 pounds. 4/ Pounds of 16-percent mixed dairy feed equal in value to 1 pound whole milk. 5/ Pounds of laying feed equal in value to 1 dozen eggs. 6/ Pounds of broiler grower feed equal in value to 1 pound broiler, live weight. 7/ Pounds of turkey grower feed equal in value to 1 pound of turkey, live weight.

Sources: Agricultural Prices, Agricultural Statistics Board, USDA.
Livestock, Meat & Wool Market News, Agricultural Marketing Service, USDA.

Appendix table 13--Price trends, selected feeds, and corn products

Item	Unit	Sept.-Aug. 1987/88 1/	1989						
			Jan.	Feb.	Mar.	Apr.	May	June	July
Wholesale, mostly bulk 2/:									
Soybean meal, 44% solvent, Decatur	$/ton	214.59	249.30	234.10	237.10	220.75	214.70	227.50	NA
Soybean meal, high protein, Decatur	"	231.95	270.10	252.10	254.00	238.00	232.30	246.25	NA
Cottonseed meal, 41% solvent, Memphis	"	173.20	200.50	191.25	196.25	184.40	161.50	163.30	NA
Linseed meal, 34% solvent, Minneapolis	"	153.58	164.00	151.25	150.00	155.00	156.00	162.50	NA
Meat and bone meal, Kansas City	"	250.36	275.40	261.10	266.00	254.40	229.30	258.10	NA
Fishmeal, 67% protein, East Coast	"	453.78	463.50	436.60	427.50	413.10	395.00	383.75	NA
Corn gluten feed, Illinois pts.	"	115.68	127.10	120.90	118.90	120.40	112.50	108.00	NA
Corn gluten feed, 60% protein, Illinois pts.	"	303.11	281.00	288.10	280.60	275.60	272.00	270.63	NA
Brewers' dried grains, Milwaukee	"	106.55	146.00	141.25	126.25	121.90	114.00	110.00	NA
Distillers' dried grains, Lawrenceburg, Indiana	"	131.63	138.00	138.00	140.00	145.50	144.00	140.00	NA
Feather meal, Arkansas pts.	"	242.98	298.00	282.50	285.00	260.00	213.00	215.50	NA
Wheat bran, Kansas City	"	73.47	93.90	107.40	102.10	83.25	78.40	60.50	NA
Wheat middlings, Kansas City	"	73.47	93.90	107.40	102.10	83.25	78.40	60.50	NA
Rice bran, f.o.b. mills, Arkansas	"	57.89	74.70	57.10	73.75	62.25	56.40	56.75	NA
Hominy feed, Illinois pts.	"	81.58	97.60	90.60	93.90	96.75	89.00	83.75	NA
Alfalfa meal, dehydrated, Kansas City	"	107.67	139.00	138.00	141.00	145.50	149.20	134.00	NA
Cane molasses, New Orleans	"	57.77	66.90	66.25	57.50	57.50	55.75	55.60	NA
Molasses beet pulp, Los Angeles	"	100.83	127.00	128.50	133.00	124.50	125.40	70.00	NA
Animal fat, Kansas City	c/lb.	11.79	12.50	12.00	12.00	12.00	11.40	10.90	NA
Urea, 42% nitrogen, Forth Worth	$/ton	225.00	225.00	212.00	189.00	190.00	190.00	190.00	NA
Corn, no. 2 white, Kansas City	$/bu.	2.55	3.90	3.88	3.88	3.88	3.88	3.70	NA
Prices paid, U.S. basis 3/ 4/:									
Soybean meal, 44%	$/cwt	19.32	16.60	---	---	15.60	---	---	15.60
Cottonseed meal, 41%	"	18.64	15.70	---	---	15.70	---	---	15.10
Wheat bran	"	12.31	10.80	---	---	11.00	---	---	10.90
Wheat middlings	"	11.03	9.73	---	---	9.68	---	---	9.08
Broiler grower feed	$/ton	268.08	246.00	---	---	240.00	---	---	236.00
Laying feed	"	248.39	215.00	---	---	211.00	---	---	209.00
Turkey grower feed	"	303.84	260.00	---	---	250.00	---	---	251.00
Chick starter	"	275.3	244.00	---	---	242.00	---	---	243.00
Dairy feed, 16%	"	225.42	196.00	---	---	192.00	---	---	184.00
Beef cattle concentrate, 32-36% protein 5/	$/cwt	316.97	273.00	---	---	271.00	---	---	263.00
Hog concentrate, 38-42% protein 5/	"	426.23	362.00	---	---	344.00	---	---	346.00
Stock salt 5/	"	4.29	3.34	---	---	3.38	---	---	3.39
Corn products, wholesale 6/:									
Corn meal, yellow, New York	$/cwt	11.88	13.13	13.00	13.28	13.11	13.15	13.21	13.28
Grits (brewers'), Chicago	"	8.34	10.03	9.87	10.04	9.89	10.49	10.02	10.09
Syrup, Midwest/West	c/lb.	8.42	10.87	10.41	10.15	10.46	10.46	11.96	11.96
Sugar (dextrose), Midwest	"	22.43	24.50	24.50	24.60	25.00	25.00	25.00	25.00
High-fructose (dried weight in tank cars), Midwest	"	11.42	11.50	11.50	12.27	13.90	14.38	15.15	15.58
Corn starch, f.o b. Midwest	$/cwt	10.71	10.00	10.25	10.25	10.00	10.25	10.62	10.65

--- = Not applicable.
NA = Not available.
1/ Preliminary. 2/ Grain and Feed Market News, Agricultural Marketing Service, USDA, except urea which is from Feedstuffs, Miller Publishing Co., Minneapolis, Minnesota. 3/ Agricultural Prices, Agricultural Statistics Board, USDA. 4/ Prices paid data is available on a quarterly basis only. 5/ Prices previously published in cwt. 6/ Milling and Baking News, Kansas City, Missouri, except starch which is from industry sources.

Appendix table 14--Corn, sorghum, barley, and oats exports, 1986/87 to date 1/

Year and month	Corn		Sorghum	Year and month	Barley		Oats	
	Grain only	Total			Grain only	Total	Grain only	Total
	Bushels				Bushels			
1986/87:				1986/87:				
Sept.	80,082,655	81,263,962	14,227,263	June	2,000	276,815	79,108	128,492
Oct.	124,025,138	124,843,757	18,547,828	July	1,164,620	1,597,139	81,504	217,421
Nov.	114,104,314	114,952,811	14,680,456	Aug.	12,319,164	12,514,711	73,364	335,437
1st Qtr.	318,212,107	321,060,530	47,455,547	1st Qtr.	13,485,784	14,388,665	233,976	681,350
Dec.	109,759,488	110,685,062	19,954,747	Sept.	12,772,707	12,912,177	121,288	327,625
Jan.	104,283,400	105,274,114	15,484,239	Oct.	16,480,986	16,559,353	167,403	411,976
Feb.	98,787,906	99,445,787	20,749,712	Nov.	14,292,746	14,363,851	32,293	167,870
2nd Qtr.	312,830,794	315,404,963	56,188,698	2nd Qtr.	43,546,439	43,835,381	320,984	907,471
Mar.	143,717,211	145,375,500	24,415,530	Dec.	14,532,134	14,661,828	17,314	315,049
Apr.	183,288,269	184,280,573	12,956,519	Jan.	1,205,709	1,262,335	30,960	75,145
May	169,091,351	170,576,405	13,788,332	Feb.	16,084,544	16,522,282	30,776	178,452
3rd Qtr.	496,096,831	500,232,478	51,160,381	3rd Qtr.	31,822,387	32,446,445	79,050	568,646
June	120,026,244	120,818,241	12,940,287	Mar.	17,639,725	18,150,611	115,234	277,846
July	133,984,531	134,900,706	22,883,734	Apr.	16,599,968	17,153,570	105,251	191,418
Aug.	111,320,100	112,008,863	7,698,710	May	10,522,937	10,726,481	67,436	168,607
4th Qtr.	365,330,875	367,727,810	43,522,731	4th Qtr.	44,762,630	46,030,662	287,921	637,871
Total	1,492,470,607	1,504,425,781	198,327,357	Total	133,617,240	136,701,153	921,931	2,795,338
1987/88:				1987/88:				
Sept.	135,403,937	136,130,948	17,832,858	June	517,681	754,738	104,217	187,886
Oct.	137,693,604	138,785,098	16,734,001	July	7,421,463	7,675,576	50,113	92,430
Nov.	122,468,369	123,086,306	10,296,951	Aug.	8,813,825	9,257,652	18,135	153,171
1st Qtr.	395,565,910	398,002,352	44,863,810	1st Qtr.	16,752,969	17,687,966	172,465	433,487
Dec.	148,189,862	149,286,585	21,462,657	Sept.	10,014,514	10,217,330	24,184	62,343
Jan.	133,442,601	134,301,735	19,428,923	Oct.	16,474,137	17,009,495	62,220	144,789
Feb.	123,706,547	124,687,685	22,498,453	Nov.	17,914,754	18,114,982	38,617	99,130
2nd Qtr.	405,339,010	408,276,004	63,390,033	2nd Qtr.	44,403,405	45,341,807	125,021	306,262
Mar.	164,120,347	165,290,216	24,662,618	Dec.	15,583,102	16,123,445	5,680	36,703
Apr.	166,544,265	167,301,461	30,340,887	Jan.	9,595,582	9,832,999	96,376	147,370
May	180,228,794	181,240,672	22,103,010	Feb.	6,764,525	7,239,965	29,937	148,578
3rd Qtr.	510,893,406	513,832,349	77,106,515	3rd Qtr.	31,943,209	33,196,409	131,993	332,651
June	132,984,257	133,834,129	13,740,797	Mar.	15,349,596	15,756,272	24,173	49,618
July	125,143,728	126,481,200	20,243,604	Apr.	8,796,666	9,029,851	12,420	114,674
Aug.	153,230,968	154,112,459	11,996,893	May	4,470,071	4,979,881	22,950	215,233
4th Qtr.	411,358,953	414,427,788	45,981,294	4th Qtr.	28,616,333	29,766,004	59,543	379,525
Total	1,723,157,278	1,734,538,492	231,341,652	Total	121,715,916	125,992,186	489,022	1,451,925
1988/89:				1988/89:				
Sept.	154,515,167	155,407,609	27,007,863	June	12,108,210	12,402,962	102,245	258,289
Oct.	174,032,976	175,250,327	19,499,969	July	11,513,586	11,757,762	38,739	88,239
Nov.	149,832,944	151,230,592	18,305,771	Aug.	2,214,904	2,500,232	24,394	145,962
1st Qtr.	478,381,088	481,888,528	64,813,603	1st Qtr.	25,836,700	26,660,955	165,378	492,490
Dec.	172,593,812	173,646,874	27,308,107	Sept.	8,758,198	8,833,519	21,017	90,049
Jan.	175,221,513	176,487,573	32,501,841	Oct.	1,513,507	2,242,594	30,378	57,096
Feb.	154,909,994	158,177,973	33,002,703	Nov.	2,625,600	3,228,822	73,371	126,759
2nd Qtr.	502,725,319	508,312,420	92,812,651	2nd Qtr.	12,897,305	14,304,935	124,766	273,904
Mar.	202,840,169	206,563,860	30,648,140	Dec.	15,121,435	15,440,102	29,605	51,848
Apr.	177,475,933	180,898,856	28,248,011	Jan.	84,517	417,785	115,957	154,015
May	211,303,127	212,764,901	21,239,060	Feb.	81,490	439,958	65,245	112,585
3rd Qtr.	591,619,229	600,227,617	80,135,211	3rd Qtr.	15,287,442	16,297,846	210,807	318,448
June	223,487,607	225,359,132	24,105,107	Mar.	1,964,297	2,424,381	22,487	70,294
July				Apr.	13,817,421	14,373,832	27,765	69,774
Aug.				May	9,781,368	10,571,462	27,121	60,581
4th Qtr.	223,487,607	225,359,132	24,105,107	4th Qtr.	25,563,086	27,369,674	77,373	200,649
Total	1,796,213,242	1,815,787,696	261,866,572	Total	79,584,533	84,633,410	578,324	1,285,491
1989/90:				1989/90:				
Sept.				June	7,412,020	8,169,340	73,555	134,619

1/ Total corn exports include grain only (white, yellow, seed, relief), dry process (cornmeal for relief, as grain, grits), includes grain only (grain for malting purposes, other) and barley malt. Oats include grain and oatmeal (bulk and packaged).
Source: Bureau of the Census, U.S. Department of Commerce.

Appendix table 15--Corn, sorghum, barley, and oats imports, 1986/87 to date 1/

Year and month	Corn		Sorghum	Year and month	Barley		Oats	
	Grain only	Total			Grain only	Total	Grain only	Total
	Bushels				Bushels			
1986/87:				1986/87:				
Sept.	311,213	332,783	6,329	June	1,296,495	1,501,548	5,325,371	5,345,316
Oct.	66,792	107,949	0	July	15,140	223,046	1,841,943	1,868,602
Nov.	333,201	353,750	33	Aug.	19,469	210,558	1,537,423	1,559,704
1st Qtr.	711,206	794,482	6,362	1st Qtr.	1,331,104	1,935,152	8,704,737	8,773,622
Dec.	66,353	131,009	0	Sept.	75,927	307,474	846,095	879,869
Jan.	85,979	134,935	0	Oct.	31,578	207,980	1,262,426	1,292,827
Feb.	14,207	52,622	86	Nov.	926,059	1,193,914	2,695,161	3,342,153
2nd Qtr.	166,539	318,566	86	2nd Qtr.	1,033,564	1,709,368	4,803,682	5,514,849
Mar.	29,812	63,602	0	Dec.	173,536	310,750	1,241,736	1,261,139
Apr.	400,056	428,391	0	Jan.	392,962	681,307	3,981,067	4,020,146
May	19,009	30,652	0	Feb.	625,953	772,737	3,994,932	4,027,553
3rd Qtr.	448,877	522,645	0	3rd Qtr.	1,192,451	1,764,794	9,217,735	9,308,838
June	326,401	339,131	0	Mar.	1,808,103	1,888,079	2,277,619	2,300,061
July	32,223	48,591	197	Apr.	508,133	591,606	3,401,071	3,434,844
Aug.	71,486	471,582	0	May	792,379	849,842	3,951,545	3,988,454
4th Qtr.	430,110	471,582	197	4th Qtr.	3,108,615	3,329,527	9,630,235	9,723,359
Total	1,756,732	2,107,275	6,645	Total	6,665,734	8,738,841	32,356,389	33,320,668
1987/88:				1987/88:				
Sept.	130,361	151,725	0	June	683,655	895,759	3,730,421	3,760,272
Oct.	354,333	373,790	24	July	195,998	448,601	1,717,932	1,735,424
Nov.	77,145	101,481	15	Aug.	220,222	434,668	1,541,932	1,582,741
1st Qtr.	561,839	626,997	39	1st Qtr.	1,099,875	1,779,029	6,990,285	7,078,437
Dec.	246,126	298,521	0	Sept.	1,061,243	1,396,496	1,712,779	1,744,204
Jan.	126,012	167,032	0	Oct.	926,329	1,222,581	1,270,484	1,372,822
Feb.	332,569	388,773	19	Nov.	876,498	1,209,707	5,106,952	5,148,944
2nd Qtr.	704,707	854,325	19	2nd Qtr.	2,864,070	3,828,784	8,090,215	8,265,970
Mar.	593,592	683,203	12	Dec.	1,146,248	1,384,778	2,537,116	2,566,987
Apr.	662,637	739,543	50	Jan.	1,846,528	2,038,574	4,086,315	4,154,507
May	113,606	140,762	0	Feb.	1,318,218	1,605,421	9,167,026	9,213,156
3rd Qtr.	1,369,835	1,563,509	62	3rd Qtr.	4,310,994	5,028,773	15,790,457	15,934,651
June	347,181	376,601	0	Mar.	1,163,560	1,280,709	6,426,933	6,482,646
July	257,479	275,042	0	Apr.	986,537	1,063,805	3,701,098	3,737,802
Aug.	169,701	207,314	7,229	May	876,452	961,089	4,721,106	4,756,988
4th Qtr.	774,361	858,958	7,229	4th Qtr.	3,026,549	3,305,603	14,849,137	14,977,436
Total	3,410,742	3,903,789	7,350	Total	11,301,488	13,942,189	45,720,094	46,256,494
1988/89:				1988/89:				
Sept.	148,437	177,913	0	June	1,596,106	1,700,185	5,680,015	5,772,502
Oct.	296,701	308,058	3,673	July	930,207	1,029,127	2,276,583	2,365,501
Nov.	180,789	233,514	0	Aug.	317,223	417,363	4,298,356	4,485,006
1st Qtr.	625,927	719,485	3,673	1st Qtr.	2,843,536	3,146,676	12,254,954	12,623,008
Dec.	106,151	173,241	0	Sept.	240,729	365,319	2,059,442	2,367,645
Jan.	307,023	723,699	0	Oct.	402,245	555,196	3,995,388	4,239,340
Feb.	178,260	591,385	15,130	Nov.	1,523,621	1,651,752	5,834,991	6,184,617
2nd Qtr.	591,434	1,488,325	15,130	2nd Qtr.	2,166,595	2,572,267	11,889,821	12,791,602
Mar.	420,381	742,935	0	Dec.	490,420	578,085	4,696,591	5,153,441
Apr.	633,060	845,387	5	Jan.	729,443	838,489	6,100,483	6,906,243
May	162,021	356,329	0	Feb.	1,627,551	1,720,819	9,313,487	10,172,629
3rd Qtr.	1,215,462	1,944,651	5	3rd Qtr.	2,847,414	3,137,394	20,110,561	22,232,313
June	33,363	212,637	14	Mar.	762,924	851,359	7,169,256	8,042,377
July				Apr.	753,742	857,654	4,750,564	5,431,135
Aug.				May	1,136,714	1,239,385	6,723,912	7,307,316
4th Qtr.	33,363	212,637	14	4th Qtr.	2,653,380	2,948,399	18,643,732	20,780,828
Total	2,466,186	4,365,097	18,822	Total	10,510,925	11,804,736	62,899,069	68,427,752
1989/90:				1989/90:				
Sept.				June	1,649,125	1,745,195	3,146,832	3,791,155

1/ Corn includes grain only (yellow dent corn, other), seed, and cornmeal. Sorghum is grain only. Barley includes grain only barley for malting, other), pearl barley, milled and malting. Oats include grain (hulled or unhulled), unhull oats fit and unfit for human consumption, and oatmeal fit for human consumption.

Source: Bureau of the Census, U.S. Department of Commerce.

Appendix table 16--Shipments of grain on the Illinois Waterway and the Mississipp

Crop year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
						Million tons
1981/82	3.4	3.4	4.6	3.9	1.2	0.8
1982/83	4.1	3.2	4.2	3.2	2.7	2.3
1983/84	5.3	4.9	5.7	4.4	1.0	3.6
1984/85	3.1	4.6	5.5	3.1	2.0	0.9
1985/86	2.4	2.6	4.3	3.3	1.8	1.7
1986/87	3.2	3.1	5.2	2.4	1.2	1.7
1987/88	3.3	3.8	3.9	2.9	1.9	2.0
1988/89	3.3	3.3	3.9	3.5	1.7	1.5

Source: Mississippi River Barge Traffic, U.S. Army Corps of Engineers, Rock Is

Appendix table 17--Barge rates for grain shipments to New Orleans, Louisiana 1/

Crop year	Origin	Sept.	Oct.	Nov.	Dec.	Jan.
1984-85	Peoria, IL	7.77	8.07	6.71	5.79	7.34
	St Louis, MO	5.94	5.92	5.15	3.98	4.36
1985-86	Peoria, IL	5.26	7.93	6.48	9.08	7.22
	St Louis, MO	4.32	6.42	4.80	5.35	4.39
1986-87	Peoria, IL	8.37	10.54	6.64	5.16	4.95
	St Louis, MO	6.52	7.52	5.06	3.62	3.28
1987-88	Peoria, IL	8.66	9.04	7.38	5.68	7.32
	St Louis, MO	6.58	6.97	5.73	4.29	4.39
1988-89	Peoria, IL	9.80	10.32	7.88	8.81	7.32
	St Louis, MO	7.91	8.35	5.94	6.11	5.19

1/ Assumes all traffic on the Illinois River originates at Peoria, IL.
Source: Based on rates reported by Transportation Situation, Illinois Dept. of

Appendix table 18--Weekly average of rail car loadings of grain and soybeans, 19

Year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
						Carloads
1979/80	28,576	32,118	32,558	30,500	30,504	31,025
1980/81	32,127	24,114	31,450	28,106	34,396	31,108
1981/82	25,607	25,609	27,419	22,384	22,967	27,220
1982/83	20,321	29,523	25,350	21,888	24,700	26,318
1983/84	29,735	31,414	29,515	25,927	31,068	29,105
1984/85	29,162	24,482	28,587	25,441	25,310	23,688
1985/86	18,889	26,227	28,214	23,482	25,424	22,558
1986/87	27,329	33,605	29,877	24,827	23,086	26,663
1987/88	32,977	32,820	29,947	29,225	32,223	34,224
1988/89	28,867	30,709	27,143	27,384	30,178	29,890

NA = Not available.
Source: Association of American Railroads.

sippi River (Locks 11-22), 1981/82-1988/89

o.	Mar.	Apr.	May	June	July	Aug.	Average
tons							
8	2.1	4.1	3.8	4.4	3.9	5.0	3.4
3	3.8	3.3	3.9	4.2	4.2	4.8	3.6
5	4.5	5.3	4.4	3.7	3.4	3.3	4.1
9	3.1	4.1	3.1	3.2	3.4	3.0	3.3
7	2.9	3.4	3.6	3.2	2.5	3.3	2.9
7	3.6	3.8	4.0	3.8	2.8	3.5	3.2
0	3.0	4.2	4.3	3.6	2.7	3.3	3.2
5	2.6	3.5	4.3	4.1	3.9		3.3

Island District.

1/

Feb.	Mar.	Apr.	May	June	July	Aug.	Average
--Dollars per ton--							
6.87	5.73	5.08	4.33	4.76	4.83	4.63	5.99
4.20	3.88	3.79	3.29	3.39	3.34	3.64	4.24
5.64	4.28	4.13	3.90	3.70	3.70	6.21	5.63
3.87	3.18	3.14	2.97	2.99	2.96	4.62	4.08
5.23	6.96	5.88	5.44	6.16	6.15	6.46	6.50
3.52	5.27	4.54	3.77	4.30	4.37	4.99	4.73
6.89	8.16	7.25	6.19	9.86	9.79	7.61	7.82
4.59	6.13	5.47	4.65	7.56	6.81	6.46	5.80
7.26	7.08	5.85	5.34	6.13	4.92		7.34
5.31	5.40	4.18	3.72	4.44	3.68		5.48

of Agriculture.

1979/80-1988/89

Mar.	Apr.	May	June	July	Aug.	Average
30,170	26,546	23,606	28,333	32,584	32,921	29,953
27,657	23,490	21,291	28,014	22,162	26,152	27,506
26,813	25,798	23,755	22,540	27,020	25,123	25,188
26,807	21,243	20,849	21,393	27,942	27,461	24,483
27,666	26,784	23,616	24,335	26,632	29,848	27,970
23,340	20,164	17,715	24,724	22,662	20,218	23,791
20,648	17,743	17,673	24,907	24,426	24,342	22,878
27,134	25,046	26,189	32,154	32,257	30,825	28,249
34,241	32,963	30,861	33,316	29,678	27,081	31,630
31,766	30,144	25,942	27,305	25,055	NA	28,580

Appendix table 19--Rail freight rate index for grain, crop years 1979 to 1988
(December 1984=100)

Year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
1979/80	64.2	69.5	69.6	70.2	70.2	71.4
1980/81	78.3	78.8	78.8	79.2	83.1	84.1
1981/82	88.5	89.4	89.4	89.4	93.6	93.6
1982/83	93.0	93.0	93.0	93.0	93.9	93.9
1983/84	93.9	94.2	94.2	94.2	98.0	98.0
1984/85	98.4	100.0	100.0	100.0	100.0	100.0
1985/86	98.0	98.0	98.0	98.0	98.9	99.0
1986/87	99.2	98.5	98.5	97.8	98.3	98.3
1987/88	98.9	99.2	99.1	98.5	101.2	101.2
1988/89	109.3	108.3	108.5	108.2	109.2	109.2

NA = Not available.
Source: Bureau of Labor Statistics, U.S. Dept. of Labor.

Appendix table 20--Hay (all): Acreage, supply, and disappearar

Item	Unit	1983/84	1984/8
Acreage harvested	Mil. acres	59.7	61.4
Yield per acre	Tons	2.36	2.45
Carryover (May 1)	Mil. tons	28.1	20.1
Production	"	140.8	150.6
Supply	"	168.9	170.7
Disappearance	"	148.8	143.8
Roughage-consuming animal units (RCAU's)	Mil. units	87.1	83.6
Supply per RCAU	Tons	1.94	2.04
Disappearance per RCAU	"	1.71	1.72

NA = Not available.

988

.	Mar.	Apr.	May	June	July	Aug.	Average
.4	70.5	72.7	72.8	73.3	76.6	76.9	71.5
.1	85.0	84.8	84.8	85.7	88.0	88.5	83.3
.6	93.6	93.6	93.6	93.6	93.6	93.6	92.1
.9	93.9	93.9	93.9	93.9	93.9	93.9	93.6
.0	98.0	98.0	98.0	98.0	98.4	98.4	96.8
.0	99.3	99.3	98.7	97.3	96.4	96.3	98.8
.0	99.0	99.1	99.2	99.2	99.2	99.2	98.7
.3	98.8	98.6	98.5	98.6	98.6	98.5	98.5
.2	101.4	102.7	104.1	104.3	106.4	109.3	102.2
.2	109.2	109.2	108.8	107.8	NA	NA	108.8

arance, 1983/84-1989/90

/85	1985/86	1986/87	1987/88	1988/89	1989/90
.4	60.4	62.4	60.7	65.6	63.1
.45	2.46	2.49	2.46	1.93	2.31
.1	26.9	26.7	32.4	27.4	17.6
.6	148.6	155.5	149.3	126.8	145.2
.7	175.5	182.2	181.7	154.2	162.8
.8	148.8	149.8	154.4	136.5	NA
.6	81.2	79.0	77.3	77.7	NA
.04	2.16	2.31	2.35	1.98	NA
.72	1.83	1.90	2.00	1.76	NA

Appendix table 21--Hay: Average prices received by farmers, United States by months, 1983/84-1989/90 1/

Year	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Average 2/
						$/ton							
Alfalfa:													
1983/84	83.80	78.30	77.40	77.40	79.10	82.40	80.10	81.70	82.00	85.10	84.40	84.30	81.33
1984/85	87.10	80.10	75.60	72.80	73.90	76.70	74.30	77.50	76.20	76.40	75.80	76.70	76.93
1985/86	85.50	74.90	72.50	68.10	70.70	70.50	67.70	69.10	70.20	71.30	72.00	69.80	71.86
1986/87	69.50	64.10	61.40	60.10	58.80	59.90	57.90	60.70	58.80	61.10	62.80	67.90	61.92
1987/88	77.70	67.40	65.70	64.60	69.30	68.00	64.60	68.80	66.50	69.60	72.50	76.90	69.31
1988/89	85.50	82.70	88.10	86.70	89.40	92.00	92.80	96.40	98.30	101.00	106.00	110.00	
1989/90	108.00	101.00 3/	91.40										
Other hay:													
1983/84	58.90	56.10	54.30	52.90	57.80	59.50	62.10	64.30	63.30	63.80	64.90	66.50	60.37
1984/85	64.90	63.40	61.80	60.90	62.40	62.00	62.60	64.80	64.70	61.70	58.40	62.40	62.50
1985/86	58.70	54.00	57.00	58.40	58.60	58.20	55.30	56.00	56.10	56.00	54.80	54.90	56.50
1986/87	54.00	50.90	50.00	51.00	52.70	50.00	49.70	49.40	48.10	50.90	48.30	48.20	50.27
1987/88	51.00	49.60	50.00	52.20	52.40	53.00	53.60	53.30	52.20	51.50	51.70	51.90	52.09
1988/89	57.50	61.60	66.60	68.70	70.60	69.80	72.30	72.50	74.00	74.40	75.70	77.50	
1988/89	77.20	68.30 3/	65.40										
All hay:													
1983/84	78.10	72.70	71.20	71.20	74.70	76.80	75.10	76.70	76.60	78.70	79.40	79.80	75.80
1984/85	82.50	76.10	72.40	70.40	70.70	73.10	71.40	73.40	73.00	73.10	72.20	72.50	72.70
1985/86	80.80	70.20	67.90	65.20	67.10	67.50	64.30	65.40	65.80	66.70	67.10	66.20	67.60
1986/87	66.70	61.00	58.80	58.20	57.60	57.90	56.00	57.70	56.10	58.50	59.20	64.10	59.70
1987/88	71.70	62.90	61.20	62.70	64.10	64.20	61.10	63.20	62.80	64.60	67.20	71.40	65.10
1988/89	81.10	77.40	82.30	82.10	85.10	86.80	87.60	89.60	91.20	93.70	98.10	104.00	87.10
1989/90	104.00	94.80 3/	85.40										

1/ Prices reported for mid-month. 2/ U.S. season average prices weighted by monthly marketings. 3/ Preliminary.

Source: Agricultural Prices, Agricultural Statistics Board, USDA.

Appendix table 22--Processed feeds: Quantity fed, 1986/87 to date 1/

	Crop years				
	1986/87	1987/88	June	July	Aug.
High protein:					
Oilseed meal--					
Soybean 2/	18,495	19,301	1,896	1,785	1,855
Cottonseed	1,026	1,442	128	97	110
Peanut	95	100	12	14	6
Sunflower	269	381	33	30	(2
Total	19,885	21,224	2,070	1,926	1,969
Animal proteins--					
Tankage and meat meal	2,395	2,471	195	199	223
Fishmeal and solubles	518	481	NA	NA	NA
Total	2,913	2,952	195	199	223
Grain protein feeds--					
Gluten feed and meal	1,165	1,321	208	216	271
Brewers' dried grains	146	120	10	9	10
Distillers' dried grains	805	1,046	102	76	91
Total	2,116	2,487	320	302	3
Other:					
Wheat millfeeds	5,649	5,659	468	461	525
Alfalfa meal	589	554	41	45	42
Fats and oils	832	892	76	75	77
Total	7,070	7,105	585	580	644
Grand total 3/	31,984	33,768	3,170	3,006	3,208

NA = Not available.
1/ Adjusted for stocks, productions, foreign trade, and nonfeed uses where
to U.S. territories. 3/ Monthly totals exclude fishmeal and solubles. 4/ E

g.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
	1988				1989				
			1,000 metric tons						
855	1,822	1,460	1,780	1,577	1,563	1,425	1,466	1,321	1,420
110	111	101	153	159	150	147	162	105	107
6	6	5	10	11	11	14	16	16	17
(2)	14	31	38	31	28	22	36	27	0
969	1,954	1,598	1,982	1,778	1,752	1,609	1,680	1,469	1,544
223	214	209	214	200	191	181	190	177	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
223	214	209	214	200	191	181	190	177	NA
271	87	128	(54)	87	119	92	90	77	132
10	9	9	8	8	8	9	10	10	10
91	100	98	106	32	3	67	96	84	73
372	196	234	60	127	130	168	196	171	215
525	497	516	524	517	490	442	439	440	459
42	45	50	57	52	51	41	45	31	29
77	79	81	78	74	78	73	77	79	83
644	621	647	659	643	619	556	561	550	571
208	2,985	2,688	2,915	2,748	2,692	2,514	2,627	2,367	4/ 2,330

re applicable. 2/ Includes use in edible soy products and shipments
Excludes animal proteins.

Get these timely reports from USDA's Economic Research Service

These periodicals bring you the latest information on food, the farm, and rural America to help you keep your expertise up-to-date. Get the latest facts, figures, trends, and issues from ERS. To subscribe to these periodicals, call toll free, 1-800-999-6779, or use the order form on the next page.

Agricultural Outlook. Presents USDA's farm income and food price forecasts. Emphasizes the short-term outlook, but also presents long-term analysis of issues ranging from international trade to U.S. land use and availability. Packed with more than 50 pages of charts, tables, and text that provide timely and useful information. 11 issues annually.

Economic Indicators of the Farm Sector. Updates economic trends in U.S. agriculture. Each issue explores a different aspect of income and expenses: national and State financial summaries, production and efficiency statistics, costs of production, and an annual overview of the farm sector. 5 issues annually.

Farmline. Concise, fact-filled articles focus on economic conditions facing farmers, how the agricultural environment is changing, and the causes and consequences of those changes for farm and rural people. Synthesizes farm economic information with charts and statistics. 11 issues annually.

Foreign Agricultural Trade of the United States. Every 2 months brings you quantity and value of U.S. farm exports and imports plus price trends. Subscription also includes monthly update newsletters and two big 300-page supplements containing data for the previous fiscal or calendar year. A must for traders.

Journal of Agricultural Economics Research. Technical research in agricultural economics, including econometric models and statistics on methods employed and results of USDA economic research. 4 issues annually.

National Food Review. Offers the latest developments in food prices, product safety, nutrition programs, consumption patterns, and marketing. 4 issues annually.

Rural Development Perspectives. Crisp, nontechnical articles on the results of the most recent and the most relevant research on rural areas and small towns and what those results mean. 3 issues annually.

Situation and Outlook Reports. These reports provide timely analyses and forecasts of all major agricultural commodities and related topics such as finance, farm inputs, land values, and world and regional developments. Specific titles are listed on the order form on the next page.

Reports. This *free* catalog describes the latest in ERS research reports. It's designed to help you keep up-to-date in all areas related to food, the farm, the rural economy, foreign trade, and the environment. 4 issues annually.

Save by subscribing for up to 3 years!	1 year	2 years	3 years
Agricultural Outlook	____ $22	____ $43	____ $63
Farmline	____ $11	____ $21	____ $30
National Food Review	____ $10	____ $19	____ $27
Economic Indicators of the Farm Sector	____ $12	____ $23	____ $33
Rural Development Perspectives	____ $9	____ $17	____ $24
Foreign Agricultural Trade of the United States	____ $20	____ $39	____ $57
Journal of Agricultural Economics Research	____ $7	____ $13	____ $18
Reports catalog	____ *FREE*		
Situation and Outlook Reports:			
Agricultural Exports (4 per year)	____ $10	____ $19	____ $27
Agricultural Income and Finance (4 per year)	____ $10	____ $19	____ $27
Agricultural Resources (5 per year, each devoted to one topic, including inputs, agricultural land values and markets, and cropland, water, and conservation)	____ $10	____ $19	____ $27
Aquaculture (2 per year)	____ $10	____ $19	____ $27
Cotton and Wool (4 per year)	____ $10	____ $19	____ $27
Dairy (5 per year)	____ $10	____ $19	____ $27
Feed (4 per year)	____ $10	____ $19	____ $27
Fruit and Tree Nuts (4 per year)	____ $10	____ $19	____ $27
Livestock and Poultry (6 per year plus 2 supplements and monthly updates)	____ $15	____ $29	____ $42
Oil Crops (4 per year)	____ $10	____ $19	____ $27
Rice (3 per year)	____ $10	____ $19	____ $27
Sugar and Sweetener (4 per year)	____ $10	____ $19	____ $27
Tobacco (4 per year)	____ $10	____ $19	____ $27
Vegetables and Specialties (3 per year)	____ $10	____ $19	____ $27
Wheat (4 per year)	____ $10	____ $19	____ $27
World Agriculture (3 per year)	____ $10	____ $19	____ $27
World Agriculture Regionals (5 per year)	____ $10	____ $19	____ $27

Supplement your subscription to *World Agriculture* with these annuals:

For *fastest* service, call toll free, 1-800-999-6779 (8:30-5:00 E.T.)

- Use purchase orders, checks drawn on U.S. banks, cashier's checks, or international money orders.
- ***Make payable to ERS-NASS.***
- Add 25 percent extra for shipments to foreign addresses (including Canada).

Mail to: ERS-NASS
P.O. Box 1608
Rockville, MD 20849-1608

Name_____

Organization_____

Address_____

City, State, Zip_____

Daytime phone_____

☐ Bill me. Enclosed is $_____. ☐ MasterCard ☐ VISA Total charges $_____.

Credit card number: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ **Expiration date:** Month/Year ☐☐

United States
Department of Agriculture
1301 New York Avenue N. W.
Washington, D. C. 20005-4788

OFFICIAL BUSINESS
Penalty for Private Use, $300

Moving? To change your address, send this sheet with label intact, showing new address, to EMS Information, Rm. 228, 1301 New York Ave., N.W. Washington, D.C. 20005-4788

FIRST-CLASS MAIL
POSTAGE & FEES PAID
U.S. Dept. of Agriculture
Permit No. G-145

What's Your Subscription Situation?

Your subscription to *Feed Situation and Outlook* expires in the month and year shown on the top line of your mailing label. **The expiration date will appear in one of two formats:** FEB89 (for February 1989) or 890430 (for April 30, 1989). Disregard this notice if no renewal date appears. Renew today by calling, toll-free, 1-800-999-6779, or return this form with your mailing label attached.

Feed Situation and Outlook **Renewal**

☐ Bill me.
☐ Enclosed is $_____.

	1 Year	*2 Years*	*3 Years*
Domestic	_____ $10.00	_____ $19.00	_____ $27.00
Foreign	_____ $12.50	_____ $23.75	_____ $33.75

Mail to:

ERS-NASS
P.O. Box 1608
Rockville, MD 20849-1608

Use purchase orders, checks drawn on U.S. banks, cashier's checks, or international money orders.
Make payable to ERS-NASS.

ATTACH MAILING LABEL HERE

Credit Card Orders:
☐ MasterCard ☐ VISA Total charges $_____.

Credit card number: | | | | | | | | | | | | | | | | |

Expiration date: | | | **Month/Year**

For *fastest* service, call toll free, 1-800-999-6779 (8:30-5:00 ET)

☆ U.S. Government Printing Office : 1989 - 241-793/81081